

Preliminary Regulatory Economic Analysis
For

The Proposed Rule Concerning Determination of
Concentration of Respirable Coal Mine Dust
(RIN-1219-AB18)

and

The Proposed Rule for
Verification of Underground Coal Mine Operators' Dust Control
Plans and Compliance Sampling for Respirable Dust
(RIN-1219-AB14),
Amending §70.2, §70.100, §70.101,
§70.201 Through § 70.210, § 70.220,
§70.370 and §75.371;
Add § 70.211 Through §70.219, and §70.221;
Revise §90.1, §90.2, and §90.3

U.S. Department of Labor
Mine Safety and Health
Administration
Office of Standards,
Regulations, and Variances

June 2000

Table of Contents

I. EXECUTIVE SUMMARY

INTRODUCTION
BACKGROUND
MINING SECTORS AFFECTED BY THE PROPOSED RULES
BENEFITS
COMPLIANCE COSTS
EXECUTIVE ORDER 12866 AND REGULATORY FLEXIBILITY ACT

II. INDUSTRY PROFILE

INTRODUCTION
THE STRUCTURE OF THE MINING INDUSTRY
STRUCTURE OF THE COAL MINING SECTOR
ECONOMIC CHARACTERISTICS OF THE COAL MINING SECTOR
THE COAL MINING SECTOR: A MOVING BASELINE?

III. BENEFITS

IV. COMPLIANCE COSTS

INTRODUCTION
SUMMARY COSTS FOR SFSS RULE AND PV RULE
METHODOLOGY
SCOPE
PART 1 - ESTIMATED COMPLIANCE COSTS FOR CITATIONS ISSUED
BASED ON MSHA INSPECTOR SFSS RESULTS
PART 2 - ESTIMATED COMPLIANCE COSTS FOR THE PROPOSED PLAN
VERIFICATION (PV) RULE
PART 2 - COST REDUCTIONS RELATED TO THE NUMBER OF CITATIONS
ISSUED BASED ON MSHA INSPECTOR SAMPLE RESULTS
PART 2 - COST REDUCTIONS RELATED TO THE REDUCED NUMBER OF
CITATIONS ISSUED BASED ON OPERATOR BI-MONTHLY SAMPLE
RESULTS
PART 2 - COST REDUCTIONS RELATED TO THE ELIMINATION OF
OPERATOR BI-MONTHLY SAMPLING
PART 2 - COST SAVINGS RELATED TO THE BLACK LUNG PROGRAM

FEASIBILITY

V. REGULATORY FLEXIBILITY CERTIFICATION

INTRODUCTION
DEFINITION OF A SMALL MINE
FACTUAL BASIS FOR CERTIFICATION

VI. OTHER REGULATORY CONSIDERATIONS

THE UNFUNDED MANDATES REFORM ACT
NATIONAL ENVIRONMENTAL POLICY ACT
EXECUTIVE ORDER 12630: GOVERNMENT ACTIONS AND INTERFERENCE

WITH CONSTITUTIONALLY PROTECTED PROPERTY RIGHTS
EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM
EXECUTIVE ORDER 13045: PROTECTION OF CHILDREN FROM
ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS
EXECUTIVE ORDER 13084: CONSULTATION AND COORDINATION WITH
INDIAN TRIBAL GOVERNMENTS
EXECUTIVE ORDER 13132: FEDERALISM

VII. PAPERWORK REDUCTION ACT of 1995

INTRODUCTION

SUMMARY OF PAPERWORK BURDEN HOURS AND RELATED COSTS

PART 1 - PAPERWORK PROVISIONS FOR THE SFSS RULE

PART 2 - PAPERWORK PROVISIONS FOR THE PV RULE

REFERENCES

I. EXECUTIVE SUMMARY

INTRODUCTION

The Mine Safety and Health Administration (MSHA) is proposing two rules to control respirable dust and silica in coal mines: (1) a single, full-shift sample (SFSS) rule, jointly proposed with the National Institute of Occupational Safety and Health (NIOSH), and (2) a plan verification (PV) rule. The proposed PV rule also contains the elimination of the bi-monthly sampling program for underground coal mine operators, which would include the elimination of the operators obligation to perform abatement sampling after being issued a citation. This Preliminary Regulatory Economic Analysis (PREA) addresses the benefits and compliance costs associated with these two proposed rules. Generally, a PREA provides an analysis of the impacts of a single proposed rulemaking. However, this PREA analyzes both the proposed SFSS rule and the proposed PV rule because of the interrelatedness of the two rules.

Section 101 of the Federal Mine Safety and Health Act of 1977 provides the authority for these rulemakings. Executive Order 12866 requires that regulatory agencies complete a Regulatory Economic Analysis (REA) for any rule having major economic consequences for the national economy, an individual industry, a geographic region, or a level of government. The

Regulatory Flexibility Act (RFA) similarly requires regulatory agencies to consider the impact of the rule on small entities. This PREA and Regulatory Flexibility Certification have been prepared to fulfill the requirements of Executive Order 12866 and the RFA. MSHA certifies that these proposed rules would not impose a significant economic impact on a substantial number of small entities.

BACKGROUND

Currently, MSHA inspectors perform sampling in coal mines to determine the mine operator's compliance with the dust standard set forth in the 1977 Mine Act. Two milligrams of respirable coal mine dust per cubic meter of air (2 mg/m³) is the current standard. If the average of a set of up to 5 MSHA inspector sample results is above MSHA's applicable dust and/or silica standards, then the operator is deemed in noncompliance and issued a citation.

The proposed SFSS rule would find that the average concentration of respirable dust and/or silica to which each miner in the active workings of a coal mine is exposed can be accurately measured over a single shift. Under the proposed SFSS rule, MSHA would no longer use the averaging method to determine noncompliance in underground and surface coal mines with respect to the MSHA inspector sampling program. Instead, MSHA would hold

the operator in noncompliance if an inspector's single full-shift sample result was above the applicable dust and/or silica standard.

With respect to the proposed PV rule, the effectiveness of a mine's ventilation plan for each mechanized mining unit (MMU) would need to be verified. Under the plan verification proposal MSHA would verify all underground coal mine operators' mine ventilation plans. MSHA would collect full shift respirable dust samples, called "verification samples," to demonstrate the adequacy of the dust control parameters specified in the mine ventilation plan in maintaining the concentration of respirable coal mine and crystalline silica dust at or below 2.0 mg/m^3 and $100 \text{ } \mu\text{g/m}^3$, respectively. The adequacy of these parameters would be demonstrated on shifts during which the amount of the material produced is at or above the "verification production level" (VPL) or the tenth highest production level recorded in the most recent thirty production shifts.

Under the proposed PV rule, mine operators would be required to: (1) provide miners' representatives the opportunity to observe verification sampling performed by MSHA with no loss of pay to the miner; (2) provide additional information in mine ventilation plans; and (3) maintain records of the amount of material produced by each MMU during each production shift.

For longwall mine operators, MSHA is also proposing to

permit the use of either approved powered, air-purifying respirators (PAPRs) or verifiable administrative controls as a supplemental means of compliance if MSHA has determined that further reduction in respirable dust levels cannot be achieved using all feasible engineering and environmental controls appropriate for the operational conditions involved.

In addition, the proposed PV rule would eliminate the bi-monthly sampling program which is currently performed by underground coal mine operators. This means that operators would no longer need to continue the practice of sampling once during every 2 month period in order to show compliance with MSHA's applicable respirable dust and silica standards. In addition, if an operator receives a citation based on an MSHA inspector's single, full-shift sample result, then the abatement sampling related to that citation would be performed by the MSHA inspector, not the operator.

The PV rule, in 30 CFR, is proposed to amend existing § 70.2, §70.100, §70.101, § 70.201, through § 70.210, § 70.220, §75.370, and §75.371; and add § 70.211, through § 70.219, and § 70.221. The PV rule applies only to underground coal miners.

MINING SECTORS AFFECTED BY THE PROPOSED RULES

The proposed SFSS rule would be applicable to all underground and surface coal mines. The proposed PV rule would

be applicable to all underground coal mines, but not to any surface coal mines. There were 2,578 coal mines in 1997, of which 968 were underground mines and 1,610 were surface mines.

BENEFITS

Occupational exposure to excessive levels of respirable coal mine dust imposes significant health risks to coal miners especially for the development of simple coal workers' pneumoconiosis (simple CWP) and progressive massive fibrosis (PMF). Occupational exposure to respirable coal mine dust is the main determinant of these diseases. Through the promulgation of the SFSS and PV rules, miners' cumulative exposure to respirable coal mine dust would be reduced since their exposure to respirable coal mine dust on each shift should be reduced to no more than the applicable standard. The reduction in cumulative exposure to respirable coal mine dust would translate into fewer cases of these diseases than would otherwise occur.

To estimate the impact of these rules MSHA used the best available data; nevertheless, we believe our estimates likely understate benefits of these rules since our analyses are restricted to a sub-population of miners with an observed pattern of overexposures, not the broader population of coal miners who will benefit from these rules. Furthermore, we had to use data collected for compliance purposes which may not represent typical environmental conditions. Therefore, at a minimum, over an

occupational lifetime (45-years) for miners who live to age 73 and who worked at MMUs with a recurrent pattern of overexposures, we estimate at least 37 fewer cases of pneumoconiosis (simple CWP and PMF) than would otherwise occur without the promulgation of these rules. To the extent that our compliance data underrepresent the number and degree of overexposures experienced by underground coal miners over their occupational lifetime, MSHA has underestimated the true benefit of these rules. Even so, our current quantitative estimate of benefits demonstrates, and qualitative discussions punctuate, that these rules would have a significant positive impact on the health of our nation's coal miners when promulgated.

Cases of simple CWP and PMF would also be prevented among other types of underground miners, for example, those working as roofbolters in designated areas, but MSHA has not attempted to quantify this portion of the benefit. Also, although difficult to quantify, it is reasonable to expect surface miners' health to be further protected by the promulgation of the single, full-shift sample rule alone since it would identify and require resolution of overexposures not previously identified.

The resulting reductions in the incidence and prevalence rates of simple CWP and PMF would not be detectable for quite some time after the pattern of overexposures has been minimized or eliminated. This is due to the latency of the development of simple CWP and PMF and the pre-existing occupational exposure histories of members of the current coal mining workforce.

COMPLIANCE COSTS

The costs of complying with the proposed SFSS rule alone, the proposed PV rule alone, and combined SFSS and PV rules, which are summarized below, appear in Table IV-1.

With respect to the proposed SFSS rule alone, annual compliance costs would be about \$1.8 million. There are no first-year-only costs (costs exclusively borne in the first year) in the SFSS rule; therefore the annual compliance costs are also equal to yearly costs. Of the \$1.8 million, all but about \$5,200 would be incurred by underground coal mine operators (the residual \$5,200 would be incurred by surface coal mine operators).

With respect to only the proposed PV rule, there would be yearly net compliance cost savings to underground coal mine operators of about \$2.04 million. Although implementing the PV rule would cost about \$4.75 million yearly, there would be offsetting yearly savings of: \$2.19 million from reduced mine operator citations issued based on MSHA inspectors' single, full-shift sample results and the elimination of associated underground operator abatement sampling; \$1.61 million from reduced mine operator citations issued based on bi-monthly sampling results and the elimination of associated underground operator abatement sampling; \$2.73 million resulting from

underground operators no longer having to perform bi-monthly operator sampling; and \$0.27 million from reduced payouts by mine operators for Black Lung cases. These costs include total first-year-only compliance costs of approximately \$3.53 million, which would be partially offset by \$2.86 million in (annual) compliance cost savings.

The joint promulgation of the SFSS and PV rules would result in yearly net compliance cost savings to operators of about \$0.25 million. The cost of these rules includes total first-year-only compliance costs of approximately \$3.53 million (from the PV rule alone), which would be partially offset by about \$1.07 million in (annual) compliance cost savings.

Due to the SFSS rule, mine operators would incur penalty cost increases, and due to the PV rule, operators would obtain penalty cost reductions. The penalty costs associated with both proposed rules are shown in Table IV-1(a). Note that penalty costs conventionally are not considered to be a cost of a rule (and, in fact, are clearly not a compliance cost) but merely a transfer payment from a party violating a rule to the government. Therefore, the penalty costs shown in Table IV-1(a) are not included as part of the costs of the SFSS or PV rules. These penalty costs are relevant, however, in determining the economic feasibility of these rules. Therefore, penalty costs are considered mining industry costs associated with these rules in

MSHA's evaluations of the rules' economic feasibility at the end of chapter IV of this document.

EXECUTIVE ORDER 12866 AND REGULATORY FLEXIBILITY ACT

Executive Order 12866 requires that regulatory agencies assess both the costs and benefits of intended regulations. MSHA has fulfilled this requirement for the proposed rules and determined that these rulemakings are not economically significant but are significant regulatory actions under Executive Order 12866.

The Regulatory Flexibility Act (RFA) requires regulatory agencies to consider a rule's economic impact on small entities. Under the RFA, MSHA must use the Small Business Administration's (SBA's) criterion for a small entity in determining a rule's economic impact unless, after consultation with the SBA Office of Advocacy, MSHA establishes an alternative definition for a small mine and publishes that definition in the Federal Register for notice and comment. For the mining industry, SBA defines "small" as a mine with 500 or fewer workers. MSHA traditionally has considered small mines to be those with fewer than 20 workers. To ensure that the proposed rules conforms with the RFA, MSHA has analyzed the economic impact of the proposed rules on mines with 500 or fewer workers (as well as on those with fewer than 20 workers).

MSHA has determined that the proposed SFSS and PV rules, both separately and in combination, would not have a significant economic impact on small mines, whether a small mine is defined as one with 500 or fewer workers or one with fewer than 20 workers.

Using the Agency's traditional definition of a small mine, which is one employing fewer than 20 workers, (1) the estimated cost of the proposed SFSS rule on small underground and surface coal mines would be about \$369,500 and \$1,100, respectively; (2) under the proposed PV rule, there would be an estimated net cost reduction of about \$930,100 for small underground coal mines; and (3) when both proposed rules are combined, the estimated cost reduction would be about \$560,600 for small underground coal mines and the estimated cost would be about \$1,100 for small surface coal mines. These estimated costs for small mines compare to estimated annual revenues of approximately \$249.4 million for underground coal mines and approximately \$498.9 million for surface coal mines.

Using SBA's definition of a small mine, which is one employing 500 or fewer workers, (1) the estimated cost of the proposed SFSS rule on small underground and surface coal mines would be about \$1,772,600 and \$5,200, respectively; (2) under the proposed PV rule, the estimated cost reduction would be about \$2,251,900 for small underground coal mines; and (3) when both

proposed rules are combined, the estimated cost savings would be about \$479,300 for small underground coal mines and the estimated cost for surface coal mines would be about \$5,200. These estimated costs for small coal mines, using SBA's criteria, compare to estimated annual revenues of approximately \$6.9 billion for underground coal mines and approximately \$10.9 billion for surface coal mines.

Based on its analysis, MSHA has determined that the proposed rules would not have a significant economic impact on a substantial number of small mines. MSHA has so certified these findings to the Small Business Administration. The factual basis for this certification is discussed in Chapter V of this PREA.

II. INDUSTRY PROFILE

INTRODUCTION

This industry profile provides background information on the structure and economic characteristics of the mining industry. It provides data on the number of mines, their size, and the number of employees, as well as information about selected market characteristics.

THE STRUCTURE OF THE MINING INDUSTRY

MSHA divides the mining industry into two major sectors based on commodity: (1) coal and (2) metal and nonmetal (M/NM). These sectors are further divided on the basis of type of operation (i.e., underground mines or surface mines). MSHA maintains its own data on mine type, size, and employment. MSHA also collects data on the number of contractors and contractor employees by industry sector.

MSHA categorizes mines by size based on employment. For purposes of these rules, MSHA has categorized mines into three groups. These are mines that employ: fewer than 20 workers; 20 to 500 workers; and more than 500 workers. Over the past 20 years, for rulemaking purposes, MSHA has consistently defined small mines to be those having fewer than 20 workers and large mines to be those having 20 or more workers. However, to comply

with the requirements of the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the Regulatory Flexibility Act (RFA), MSHA must use the Small Business Administration's (SBA's) criteria for small entities when determining a rule's economic impact. For the mining industry, SBA defines a small mine as one that employs 500 or fewer workers and a large mine as one that employs more than 500 workers. Thus, combining the first two MSHA mine categories noted above would encompass SBA's definition of a small mine.

No metal and nonmetal mines are affected by the proposed rules. Therefore, information is provided below only for the coal mining sector.

Table II-1 presents the number of small and large coal mines and the corresponding number of miners, excluding contractors, for the coal sector by mine type.¹ This table provides data for the three size categories previously identified: mines with fewer than 20 workers (MSHA's definition of a small mine); mines with 20 to 500 workers; and mines with more than 500 workers.

¹ In addition to mines in producing status, the total mine and miners figures in Table II-1 reflect non-producing entities that are still active, such as, independent shops, preparation plants, and mines that did not have or report production in 1997. Elsewhere in the preamble the number of reported producing mines and miners in those mines may be different due to these non-producing entities not being reflected. In addition, more recent mine and miner data may have been used in the preamble to obtain more general information.

Table II-1: Distribution of Coal Operations and Workers (Excluding Contractors) by Mine Type and Size for 1997

Mine Type	Size of Coal Mines						All Coal Mines	
	<20 Workers		≥20 & ≤500 Workers		>500 Workers			
	Mines	Workers	Mines	Workers	Mines	Workers	Mines	Workers
Underground	426	4,217	533	39,605	9	5,185	968	49,007
Surface	1,104	6,671	505	32,862	1	514	1,610	40,047
Office Workers	-	612	-	4,074	-	238	-	4,924
Total	1,530	11,500	1,038	76,541	10	5,937	2,578	93,978

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 1997 MIS data, CM441, cycle 1997/184. Data for total office workers from Mine Injury and Worktime Quarterly (1997 Closeout Edition) Table 1, p. 5.

Table II-2 presents corresponding data on the number of independent contractors and contractor workers working in the coal mining sector.

Table II-2: Distribution of Contractors and Contractor Employment by Size of Operation, 1997

Contractor	Contractor Size						All Contractors	
	<20 Workers		≥20 & ≤500 Workers		>500 Workers			
	Contr.	Contr. Workers	Contr.	Contr. Workers	Contr.	Contr. Workers	Contr.	Contr. Workers
Underground	1,186	4,390	88	4,243	0	0	1,274	8,633
Surface	2,457	10,146	259	10,730	1	480	2,717	21,356
Office Workers	-	341	-	1,949	-	172	-	2,462
Total	3,643	14,877	347	16,922	1	652	3,991	32,451

Source: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 1997 Final MIS data, CT441 cycle 1997/184. Data for office workers from Mine Injury and Worktime Quarterly (1997 Closeout Edition) Table 5, p. 20.

STRUCTURE OF THE COAL MINING SECTOR

MSHA classifies the U.S. coal mining sector into two major commodity groups: bituminous and anthracite. The former is further subdivided into subbituminous and lignite. Bituminous operations represent over 93% of coal mining operations, employ over 98% of all coal miners, and account for over 99% of total coal production. About 60% of the bituminous operations are large (employ 20 or more workers), whereas about 90% of the anthracite operations are small (employ fewer than 20 workers).

Surface mining methods for coal include drilling, blasting, and hauling and are similar for all coal commodity types. Most surface mines use front-end loaders, bulldozers, shovels, or trucks for haulage.

MSHA data for 1997 indicate that there are about 2,578 underground and surface coal mines, of which 1,530 (about 59%) are small and 1,048 (about 41%) are large.² This categorization is based on MSHA's traditional definitions for small and large mines, respectively. On the basis of SBA's definition, 2,568 (99.6%) are small and only 10 (0.4%) are large.

Using MSHA's definition, about 94,000 miners are employed in coal mines, of which about 11,500 (12%) work at small mines and 82,478 (88%) work at large mines.³ Using SBA's definition, about

² MSHA - CM441 Report Cycle 1997/184.

³ MSHA - CM441 Report Cycle 1997/184.

88,041 (94%) work at small mines and 5,937 (6%) work at large mines. Average employment in small and large mines are approximately 8 and 79, respectively, using MSHA's definition, and 34 and 594, respectively, using SBA's definition.

ECONOMIC CHARACTERISTICS OF THE COAL MINING SECTOR

The U.S. coal sector produced a record 1.09 billion short tons of coal in 1997. At an average price of \$18.14 per ton, the total value was estimated at \$19.8 billion.⁴ Underground mines accounted for \$7.6 billion, while surface mines accounted for \$12.2 billion. Using MSHA's definition of a small mine, of the \$19.8 billion of coal production in 1997, about \$0.8 billion was produced by small underground and surface mines, and about \$19.0 billion was produced by large underground and surface mines.⁵

Of the several different types of coal, bituminous and subbituminous coal accounted for 91.5% (996 million tons) of U.S. production in 1997. The remainder of U.S. coal production was lignite (87.6 million tons) and anthracite (4.9 million tons). Although anthracite offers superior burning qualities, it contributed only about 0.5% of U.S. coal production in 1997.

Mines east of the Mississippi accounted for about 52% of coal production in 1997. For the period 1949 through 1996, coal

⁴ U. S. Department of Energy, Energy Information Administration, Coal Industry Annual 1997, p. 154.

⁵ U. S. Department of Energy, Energy Information Administration, Annual Energy Review 1997, p. 191.

production east of the Mississippi River fluctuated relatively little from a low of 395 million tons in 1954 to a high of 630 million tons in 1990. Production in 1997 was estimated at 557 million tons. During this same period, however, coal production west of the Mississippi increased each year from a low of 20 million tons in 1959 to a record high of 511 million tons in 1997.⁶ The growth in western coal has been due, in part, to environmental concerns that led to increased demand for low-sulfur coal, which is abundant in the West. In addition, surface mining, with its higher average productivity, is much more prevalent in the West.

THE COAL MINING SECTOR: A MOVING BASELINE?

MSHA's estimates in this PREA of the costs and benefits of the proposed SFSS and PV rules are derived relative to the baseline estimates of the number and composition (by mine size and type) of coal mines and coal miners in 1997, as presented in Table II-1 and on a 1999 snapshot of the number of working mechanized mining units (MMUs) presented in Chapter IV. MSHA's analysis assumes that, in the absence of the proposed SFSS and PV rules, the number and composition of coal mines and coal miners in 1997 and the number of working MMUs in 1999 would remain constant in the future.

⁶ U. S. Department of Energy, Energy Information Administration, Annual Energy Review 1997, p. 203.

In reality, the number and composition of coal mines and coal miners have been changing over time. From 1987 to 1997, for instance, the number of coal mines declined by 47 percent and the number of coal miners declined by 41 percent. During the same period, the percentage of coal mines that were underground coal mines declined from 41 percent to 37.5 percent and the percentage of all coal mines with fewer than 20 employees declined from 68 percent to 59 percent.

It is unclear whether the factors underlying these recent changes have played themselves out or whether further changes in the number and composition of coal mines and coal miners can be anticipated. However, the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) have been conducting research and developing projections about the future of the coal mining industry.

According to DOE, the coal industry will continue to enjoy a fairly steady domestic demand for coal due to continuing usage of coal by electric utilities, the dominant purchaser of coal in this country. DOE projects that coal production will increase by an average of 0.9 percent a year from 1998 through 2020, in part due to rising natural gas costs and the retirement of nuclear plants.⁷ DOE also projects further declines in the coal miner

⁷U.S. Department of Energy, Energy Information Administration, Annual Energy Outlook 2000, pp. 87 and 138.

population of 1.5 percent a year from 1998 through 2020, despite increasing coal production, as a result of increased miner productivity and the shutdown of less productive coal mines.

EPA projects about a 0.5 percent reduction in coal production and in the number of coal miners, relative to DOE's estimates, starting in 2007 in response to EPA clean air regulations of NO_x emissions, and a (further) shift from eastern to western coal and from underground coal mining to surface coal mining.⁸

MSHA notes that these DOE and EPA projections are themselves unsure and dependent on the relative low cost of oil relative to coal and on the implementation by states of the EPA regulations of NO_x emissions. MSHA further notes the complex, and sometimes offsetting, effects that these projections about the coal industry would have on the Agency's estimates of costs and benefits presented in this PREA. For example, a declining baseline for the coal mine and miner population over time and a shift to western coal production would tend to reduce both the costs and the benefits of the proposed rules, but the increase in miner productivity and the associated increase in production per coal mine would tend to increase both the costs and the benefits of the proposed rules.

⁸U.S. Environmental Protection Agency, Office of Air and Radiation, Regulatory Impact Analysis for the Final Section 126 Petition Rule, p. 6-25.

Given the uncertainty surrounding these projections and some of the offsetting effects on costs and benefits described about, MSHA has decided to base its estimates of regulatory costs and benefits on the baseline assumption that the number and composition of coal mines and coal miners in 1997 and the number of working MMUs in 1999 will remain approximately constant in the future. MSHA requests comments on this assumption and on the likely effects on the costs and benefits of the proposed rules if this assumption is wrong.

III. BENEFITS

Occupational exposure to excessive levels of respirable coal mine dust imposes significant health risks. These include the following adverse health outcomes: simple coal worker's pneumoconiosis (simple CWP), progressive massive fibrosis (PMF), silicosis, and chronic obstructive pulmonary disease (COPD) (e.g., asthma, chronic bronchitis, emphysema).⁹ Cumulative exposure to respirable coal mine dust is the main determinant in the development of both simple CWP and PMF although other factors such as the percentage of quartz in the respirable dust and the type of coal also affect the risk of miners developing simple CWP and PMF (Jacobsen, et al., 1977; Hurley, et al., 1987; Kuempel, et al., 1995; Attfield and Morring, 1992; Attfield and Seixas, 1995). The true magnitude of occupationally induced simple CWP and PMF among today's coal miners is unknown, although prevalence estimates are available from various surveillance systems. For example, from 1970 to 1995, the prevalence of simple CWP and PMF among miners, based on the operator sponsored x-ray program, dropped from 11 percent to 3 percent (MSHA, Internal Chart, 1998). Also, later rounds of the National Study for Coal Workers' Pneumoconiosis consistently demonstrated, through prevalence rates in the range of 2.9 - 3.9 percent, that simple

⁹ See the Health Effects sections of either proposed rule's preamble for details.

CWP and PMF have not been eliminated.

Through the joint promulgation of the single, full-shift sample (SFSS) and plan verification (PV) rules, miners would be further protected from the debilitating effects of occupational respiratory disease by limiting their exposures to respirable coal mine dust to no more than the applicable standard on each and every shift.¹⁰ Reducing respirable coal mine dust concentrations over a 45-year occupational lifetime to no more than the applicable standard on just that percentage of shifts currently exhibiting an excess would lower the cumulative exposure, thereby significantly reducing the risk of both simple CWP and PMF among miners. We have estimated the health benefits of the two rules arising from the elimination of overexposures on all shifts at only those MMUs exhibiting a pattern of recurrent overexposures on individual shifts.¹¹

Based on 1999 operator data, there were 704 MMUs (out of 1,251) at which regular (not abatement) dust concentrations for the designated occupational (D.O.) samples exceeded the applicable standard on at least two of the sampling shifts reported in 1999 (MSHA, Data file:Operator.zip).¹² MSHA

¹⁰ For details, see the Quantitative Risk Assessment and Significance of Risk sections of either proposal's preamble.

¹¹ By "exhibiting a pattern of recurrent overexposures," MSHA means that, at a 95-percent confidence level, the applicable standard is exceeded on at least six shifts per year.

¹² MSHA estimates an MMU average of 384 production shifts per year. Since mine operators are required to submit five valid designated operator (D.O.) samples to MSHA every two months, there would typically be 30 valid D.O. samples — representing 30 of the 384 production shifts — for each MMU that was in operation for the full year. If dust concentrations on

considers these 704 MMUs, representing more than one-half of all underground coal miners working in production areas, to have exhibited a pattern of recurrent overexposures.¹³ The valid operator D.O. samples were collected on a total of 18,569 shifts at these 704 MMUs, the applicable standard was exceeded on about 21 percent of these shifts.

At the MMUs being considered (those exhibiting a pattern of recurrent overexposures), bringing dust concentrations down to no more than the applicable standard on each and every production shift would reduce D.O. exposures on the affected shifts by an average of 1.04 mg/m³. Assuming this average reduction applies to only 21 percent of the shifts, the effect would be to reduce cumulative exposure, for each miner exposed at or above the D.O. level, by 0.22 mg-yr/m³ over the course of a working year (i.e., 21 percent of shifts in one year, times 1.04 mg/m³ per shift). Therefore, over a 45-year working lifetime, the benefit to each affected miner would, on average, amount to a reduction in accumulated exposure of approximately 10 mg-yr/m³ (i.e., 45 years times 0.22 mg-yr/m³ per year). If, as some miners have testified, operator dust samples currently submitted to MSHA tend

two or more of the sampled shifts exceed the standard, then it follows, at a 95-percent confidence level, that the standard was exceeded on at least six shifts over the full year.

¹³ If a different definition of "exhibiting a recurrent pattern of overexposures" were used in these analyses the estimate of the reduction in risk and associated benefits would be different. For example, if the criterion were that four or more D.O. bimonthly exposure measurements exceeded the applicable standard then, with 95% confidence, at least 20 shifts would be overexposures in a year of 384 shifts. Using the four as the criterion, this would reduce the population for whom we are estimating benefits, and the estimated number of prevented cases would decrease by 19%.

to under-represent either the frequency or magnitude (or both) of individual full shift excursions above the applicable standard, then eliminating such excursions would provide a lifetime reduction of even more than 10 mg-yr/m³ for each exposed miner.

When the dust concentration measured for the D.O. exceeds the applicable standard, measurements for at least some of the other miners working at the same MMU may also exceed the standard on the same shift, though usually by a smaller amount. Furthermore, although the D.O. represents the occupation most likely to receive the highest exposure, other miners working in the same MMU may be exposed to even higher concentrations than the D.O. on some shifts. Therefore, in addition to the affected D.O. miners, there is a population of other affected miners who are also expected to experience a significant reduction in risk as a result of eliminating overexposures on their individual shifts.

To estimate how many miners other than the D.O. would be substantially affected, MSHA examined the results from all valid dust samples collected by MSHA inspectors in underground MMUs during 1999 (MSHA, Data file:Inpctor.zip). Within each MMU, the inspector typically takes one full shift sample on the D.O. and, on the same shift, four or more additional samples representing other occupations. On 896 shifts, at a total of 450 distinct MMUs, the D.O. measurement exceeded the applicable standard and

there were at least three valid measurements for other occupations available for comparison. There was an average of 1.2 non-D.O. measurements in excess of the standard on shifts for which the D.O. measurement exceeded the standard.¹⁴ For non-D.O. measurements that exceeded the standard on the same shift as a D.O. measurement, the mean excess above the standard was approximately 0.8 mg/m³.¹⁵

Combining these results with the 21-percent rate of excessive exposures observed for the D.O. on individual shifts, it is reasonable to infer that, at the MMUs under consideration, an average of 1.2 other miners, in addition to the one classified as D.O., is currently overexposed on at least 21 percent of all production shifts. Over the course of a working year, the reduction in exposure expected for these affected non-designated occupational (N.D.O.) miners is 0.17 mg-yr/m³ (i.e., 21 percent of one year, times 0.8 mg/m³).

The expected lifetime for all American males, conditional on their having reached 20 years of age, is 73 years (calculated from: U.S. Census March 1997, Table 18; U.S. Census March 1997, Table 119).¹⁶ On average, the best estimate of the lifetime

¹⁴ With 95-percent confidence, on shifts for which the D.O. measurement exceeds the standard, the mean number of other occupational measurements also exceeding the standard is at least 1.11.

¹⁵ With 95-percent confidence, the mean excess is at least 0.72 mg/m³.

¹⁶ Since females have a greater life expectancy than males, the expected benefits would increase if the proportion of female miners increases substantially in the future.

benefit to exposed miners is expressed by the reduction in prevalence of disease at age 73. To project the reduction in risk of simple CWP and PMF among affected D.O.s and N.D.O.s, MSHA applied its best estimate of dose response to a hypothetical cohort of underground coal miners who work on an MMU with a recurrent pattern of overexposure, and who, on average, begin working at age 20, retire at age 65, and live to age 73. Strengths and weaknesses of various epidemiological studies were presented in the Health Effects sections of both SFSS and PV Notice of Proposed Rulemakings (NPRM) preambles. These analyses support the selection of Attfield and Seixas (1995) as the epidemiological study that provides the best estimate of material health impairment with respect to simple CWP and PMF. Two of the distinguishing qualities of this study are the dose-response relationship over a miner's lifetime and the fact that these data best represent the recent conditions experienced by miners in the U.S. Using this relationship, it is possible to evaluate the impact on risk of both simple CWP and PMF expected from bringing respirable coal mine dust concentrations down to or below the applicable standard on every shift. This is the only contemporary epidemiological study of simple CWP and PMF providing such a relationship.

To estimate the benefits (i.e., number of cases of simple CWP and PMF prevented) of SFSS and PV combined, MSHA applied

these estimates of reduced risk to the estimated sub-populations of affected D.O. and N.D.O. miners. As of February 12, 1999, there were 984 producing MMUs; applying the QRA's pattern of 56 percent of MMUs exhibiting recurrent overexposures, by mine size, MSHA estimates there to be 552 affected MMUs (MSHA Table, November 18, 1999; MSHA Table, February 12, 1999). Based on MSHA's experience, we would expect one D.O. and seven N.D.O.s for each shift of production, at each MMU. Therefore, among underground coal miners working on an MMU, we estimate 12.5% to be designated occupational miners and 87.5% to be non-designated occupational miners. Table III-1 presents the estimated number of affected MMUs, D.O.s, and N.D.O.s, by mine size and number of production shifts.¹⁷

¹⁷ Affected MMUs in production are estimated by applying the observed percentage of MMUs' number of production shifts by mine size (as of November 18, 1999) to the snap shot of active MMUs as of February 12, 1999, by mine size, and multiplying by 0.56 (i.e., 56 percent of MMUs exhibiting a pattern of recurrent overexposures) (MSHA Table, November 18, 1999; MSHA Table, February 12, 1999).

Table III-1. Estimated Number of Affected Mechanized Mining Units^a (MMUs) and Affected Underground Coal Miners, by Production Shifts and Mine Size

Number of Production Shifts	Less than 20 Employees			20 to 500 Employees			Greater than 500 Employees			Total			
	MMUs n=	DOS ^b n=	NDOs ^c n=	MMUs n=	DOS ^b n=	NDOs ^c n=	MMUs n=	DOS ^b n=	NDOs ^c n=	MMUs n=	DOS ^b n=	NDOs ^c n=	Total Miners on MMUs
One	103	103	721	33	33	231	0	0	0	136	136	952	1,088
Two	15	30	210	289	578	4,046	0	0	0	304	608	4,256	4,864
Three	0	0	0	91	273	1,911	21	63	441	112	336	2,352	2,688
Total	118	133	931	412	884	6,188	21	63	441	552	1,080	7,560	8,640

^a Affected MMUs in production are estimated by applying the observed percentage of MMUs' number of production shifts by mine size (as of November 18, 1999) to the snapshot of active MMUs as of February 12, 1999, by mine size, and multiplied by 0.56 (since fifty-six percent of MMUs have a pattern of recurrent overexposures) (MSHA Table, November 18, 1999; MSHA Table, February 12, 1999).

Where:

^b DO = Designated Occupational Miners = {MMUs * 1 * production shifts}.

^c NDO = Non-designated Occupational Miners = {MMUs * 7 * production shifts}.

The benefits that would accrue to coal miners exposed to respirable coal mine dust and to mine operators, and ultimately to society at large, are substantial and take a number of forms. These proposed rules would reduce a significant health risk to underground coal miners, reducing the potential for illnesses and premature death and their attendant costs to miners, their employers, their families, and society.

The joint promulgation of these rules should realize a positive economic impact on the Department of Labor's (DOL's) Black Lung Program and relatedly on mine operators. The Black Lung Program compensates eligible miners and their survivors for benefits under the Black Lung Benefits Act. This program provides monthly payments and medical benefits (diagnostic and treatment) to miners who are found to be totally disabled by black lung disease, including cases of PMF and simple CWP. In 1986, DOL's Employment Standards Administration reported that 12% of approved cases of Black Lung Program were identified as cases of PMF based on chest radiographs, while sixty-four percent had simple CWP based on chest radiographs (ESA, 1986). For miners who stopped working in coal mines after 1970 and for whom the DOL can establish that the miner worked for the same operator for at least one calendar year, and that miner had at least 125 working days in that year, that operator is financially responsible for the miner's Black Lung benefit payment. If a responsible

operator cannot be identified for an eligible miner, benefit payments are made by the Black Lung Disability Trust Fund. To the extent that these rules reduce overexposures to respirable coal mine dust, there should be fewer Black Lung Program cases. Therefore, over time, the associated financial outlay by responsible operators through either insurance premiums or direct payments of Black Lung benefits should be lower than would otherwise occur. The financial impact could be substantial (See Chapter IV). In 1980, the Black Lung Program estimated average lifetime payouts for responsible operators for married miners of about \$248,700 dollars, assuming a 7-percent annual increase (ESA, 1980). In fiscal year 1999, 443 claims for Black Lung Benefits were accepted as new cases; sixty-six percent (293) are the financial responsibility of coal mine operators (Peed, 2000).

The most tangible benefit of these rules is the number of cases of simple CWP and PMF which would be prevented. Table III-2 presents the estimated number of cases of simple CWP and PMF that would be prevented among the 56 percent of MMUs currently exhibiting a pattern of recurrent overexposures. For all categories of simple CWP and PMF combined, MSHA estimates 37 fewer of these cases among affected miners than would otherwise occur without the promulgation of SFSS and PV. Eleven of these cases would be the most severe form of coal miners pneumoconiosis, PMF, and as such these cases could be interpreted

as prevented premature deaths due to occupational exposure to respirable coal mine dust. Since simple CWP predisposes the development of PMF, it is important that it also be prevented (Balaan, et al., 1993).

As discussed in the Significance of Risk sections of both rules, MSHA believes this QRA for simple CWP and PMF strikes a reasonable balance based on available data. Yet, our estimates likely understate the true impact of these rules since our analyses are restricted to a sub-population of affected miners, those working at MMUs exhibiting a pattern of recurrent overexposures, not the broader population of coal miners who would benefit from these rules. Furthermore, to estimate the average overexposure which would be prevented, MSHA had to use data collected for compliance purposes, which may not represent typical environmental conditions.

The degree to which the exposure level of respirable coal mine dust on sampling shifts may not be representative of typical exposure levels is affected by the following factors:

(1) There exists a positive relationship between coal production and generation of respirable coal mine dust;

(2) Current sampling procedures permit sampling measurements to be taken at the mid-range of the distribution of the level of production—sampling measurements must be taken on shifts with production at least 60% of the average production during the 30

days and at least 50% of average production for the last valid set of bimonthly samples for inspector and operator samples, respectively;

(3) Miners have reported and MSHA data have demonstrated lower levels of production on sampling shifts versus non-sampling shifts¹⁸;

(4) On some sampling shifts, miners have reported that more engineering controls may be engaged than on other shifts, thus reducing the measured amount of respirable coal mine dust;

(5) MSHA analyses have demonstrated, even when controlling for production, in mines with fewer than 125 employees, on continuous mining MMUs, respirable coal mine dust exposures were much higher during the unannounced Spot Inspection Program (SIP) sampling shifts than on shifts operators sampled—this is consistent with the effect of increasing engineering controls on shifts during which bimonthly samples are conducted compared to the level of use of engineering controls used on shifts for which the operator does not expect sampling to be conducted given the same production level;¹⁹

(6) Across mine size, designated area sample exposure levels have been found to be larger for shifts on which unannounced

¹⁸ Mine Safety and Health Administration. "Report of the Statistical Task Team of the Coal Mine Respirable Dust Task Group." September 1993.

¹⁹ Mine Safety and Health Administration. "Report of the Statistical Task Team of the Coal Mine Respirable Dust Task Group." September 1993.

compliance sampling occurred compared to operator sampling shifts—in one study they differed by at least a factor of 40 percent in large mines and 100 percent in the smallest mines;²⁰ and

(7) Existing MSHA technical information indicates that some reduction in production levels occurs during some sampling periods on longwalls.²¹

Therefore, at a bare minimum, over an occupational lifetime (45-years) for miners who live to age 73 and who worked at MMUs exhibiting a pattern of recurrent overexposures, we estimate at least 37 fewer cases of pneumoconiosis (simple CWP and PMF) than would otherwise occur without the promulgation of these rules. Our current quantitative estimate of benefits demonstrates and qualitative discussions punctuate that these rules would have a significant positive impact on the health of our nation's coal miners when promulgated. Yet, due to the limitations in these data, we believe our benefit estimate may understate the number of cases of simple CWP and PMF which would be prevented over an occupational lifetime.

MSHA believes that cases of simple CWP and PMF would also be prevented among other types of underground miners, such as roofbolters working in designated areas (DA). Based on MSHA

²⁰ Mine Safety and Health Administration. "Report of the Statistical Task Team of the Coal Mine Respirable Dust Task Group." September 1993. Pp 211-212.

²¹ Denk, J. M. et al., 1990.

experience it is reasonable to expect roofbolter DA's pattern of overexposures for respirable coal mine dust to be similar to that for miners with the highest exposure on a MMU. If so, we would expect 13 additional cases of simple CWP and PMF to be prevented. Affected DAs include DAs who work at the 56 percent of the MMUs under consideration who are exposed to dust concentrations similar to the D.O., over a 45-year occupational lifetime (MSHA Data file, November 1999; MSHA Data file, February 1999).

Also, it is reasonable to expect surface miners' health to be further protected by the promulgation of the SFSS rule alone since it would identify and require resolution of overexposures not previously identified and may thereby lower some miners' cumulative exposure to respirable coal mine dust. Furthermore, to the extent that cumulative exposure to respirable coal mine dust affects other adverse health outcomes, such as silicosis and chronic obstructive pulmonary disease, it is reasonable to expect a reduction in the number of cases and/or in the severity of cases for these diseases among surface and underground coal miners.

Although this effect cannot readily be quantified, to the extent that these rules would also reduce the cumulative exposure to respirable coal mine dust among some miners working in affected MMUs currently not exhibiting overexposures, it is reasonable to expect that MSHA would observe an incremental

benefit among that sub-population of coal miners. Moreover, to the extent that the cumulative dust exposure is reduced for miners working in the "outby" areas, away from the mining face (i.e., MMU) where coal is extracted from the coal seam, they too may realize occupational health benefits due to the simultaneous promulgation of these proposals. Therefore, our best estimate of 37 prevented cases of simple CWP and PMF, combined, among all affected miners likely underestimates the true benefit which would be realized by the coal mining workforce through the reduction of overexposures to no more than the applicable standard on each shift.

Clearly, PMF is associated with premature death. Since simple CWP may evolve to PMF, even after occupational exposure has ceased, it has the propensity to become a life-threatening illness. By reducing the total number of simple CWP and PMF among affected miners from 259 to 222 over 45 years,²² these standards are projected to prevent on average, four cases of simple CWP and PMF for each 5-year interval.

For all those reasons previously identified, we believe that the estimate of 37 prevented cases of simple CWP and PMF over a 45 year working life likely understates the true number of cases of simple CWP and PMF which would be prevented. This belief is

²² Applying an estimated prevalence rate of 3.0 percent to the estimated population of affected miners (8,640) results in an estimate of 259 cases of simple CWP and PMF.

further supported by the fact that during the past few years, the Black Lung Benefits Program has been approving roughly 400 claims each year. These claims come from individuals whose exposure for the most part came after the current standard of 2.0 was established in 1972. Thus, we believe the consistent identification, from year to year, of hundreds of new cases of simple CWP and PMF per year into the Black Lung Benefits Program supports our belief that the true lifetime occupational health benefits of the proposed rules are higher than we have estimated. Even assuming that the number of new claims would decline in future years simply due to the continuing decline in the number of coal miners, MSHA expects that assuring that future exposures are maintained below the 2.0 exposure limit will reduce the number of new cases of simple CWP and PMF by considerably more than 1 per year.

In addition to the prevention of simple CWP and PMF, each of the 8,640 affected miners at MMUs with a pattern of overexposures will realize some health benefit by limiting their cumulative exposure to respirable coal mine dust to no more than the applicable standard on each and every shift.

The expected number of prevented cases of simple CWP and PMF would not be realized for some time even after the pattern of overexposures has been minimized or eliminated. This is due, in part, to the latency—(that is, the disease does not develop immediately after exposure)—of the development of simple CWP and

PMF and the pre-existing occupational exposure histories of members of the current coal mining workforce. Our estimated benefit is based on the estimated number of underground coal miners working at the mine face, 17,280. If the size of this workforce significantly changed in the future and the projected pattern of prevented overexposures remained the same, the number of cases of prevented simple CWP and PMF would need to be adjusted to account for the change.

Finally, even standing alone, without simultaneously requiring that the effectiveness of underground mine ventilation plans be verified (i.e., the Plan Verification NPRM), the proposed standard allowing MSHA to use single, full-shift samples to identify overexposures requiring corrective action would provide miners with health benefits.²³ Both the prospect of being cited for overexposure and the actual issuance of additional citations due to this rule would compel mine operators to be more attentive to the level of respirable dust in their mines. Therefore, it is reasonable to expect, over time, a further decline in the number of shifts during which the concentration of respirable coal mine dust is at or above the applicable standard. Thus, implementation of the SFSS strategy will, in and of itself, on average, lower miners' cumulative exposure to respirable coal mine dust. Since cumulative exposure

²³ See detailed discussion in the Significance of Risk section in either preamble.

to respirable coal mine dust is the main determinant in the development of both simple CWP and PMF, both MSHA and NIOSH are confident that the use of single, full-shift samples, by themselves, even without the help of a verified dust control plan, would result in better health protection to miners.

Various data, assumptions and caveats were used to conduct the quantitative risk assessment, significance of risk discussion, and benefits analyses. Therefore, we request any information which would enable us to conduct more accurate analyses of the estimated health benefits of the single, full-shift sample rule and plan verification rule, both individually, and in combination.

Table III-2. Over a Working Lifetime Among Affected Miners, Estimated Number of Cases of CWP^a and PMF^b Prevented Due to the Implementation of Single, Full-Shift Sample and Plan Verification

Type of Miner	Affected Miners, n=	Simple CWP categories 1, 2, 3 or PMF		Simple CWP categories 2 or 3 or PMF		PMF	
		Reduction in Risk ^c	Prevented Cases, n=	Reduction in Risk	Prevented Cases, n=	Reduction in risk	Prevented Cases, n=
Affected Designated Occupational Miners ^d	1,080	18/1000	19.4	9.8/1000	10.6	5.1/1000	5.5
Affected Non-Designated Occupational Miners ^e	7,560	2.3/1000	17.4	1.3/1000	9.8	0.7/1000	5.3
TOTAL	8,640	na	37	na	20	na	11

^a Simple CWP: simple coal workers' pneumoconiosis.

^b PMF: progressive massive fibrosis.

^c Reduction in Risk per 1,000 affected miners, over a 45-year working lifetime.

^d Affected Designated Occupation (D.O.) Miners: includes all miners who work at the 56 percent of the Mechanized Mining Units under consideration and who are exposed to dust concentrations similar to the D.O., over a 45-year occupational lifetime.

^e Affected Non-Designated Occupation (Non-D.O.) Miners: includes all underground faceworkers under consideration who are not classified as the D.O.

IV. COMPLIANCE COSTS

INTRODUCTION

In this chapter, MSHA derives its estimate of the costs (and savings, if applicable) of complying with MSHA's proposed single, full-shift sample (SFSS) and plan verification (PV) rules. The costs and savings of the two rules in this chapter are broken down into two parts.

Part 1 of this chapter identifies the costs of implementing the SFSS rule.²⁴ As a result of the proposed SFSS rule, MSHA inspectors would make noncompliance determinations and issue citations based on a single full-shift sample result rather than the current method, which is to average a set of up to 5 single full-shift sample results. An analysis conducted by MSHA's Coal Mine Health Division indicates that this change would increase the number of citations issued by MSHA inspectors to coal mine operators. The consequence of issuing more citations is that coal mine operators would be required to take corrective action to abate the additional violation. These abatement actions would cause both underground and surface coal mine operators to incur compliance costs. There are no cost savings shown in Part 1.

Part 2 of this chapter shows the net costs of implementing

²⁴ The proposed SFSS and PV rules are intended to be joint rules which would be promulgated simultaneously. However, for purposes of exposition, MSHA first estimates the cost of complying with the proposed SFSS rule, assuming that the proposed PV rule has not yet been implemented. Then, MSHA estimates the cost of complying with the proposed PV rule, assuming that the SFSS rule has already been implemented.

the PV rule. The PV rule would cause all underground coal mines to design and implement more effective ventilation plans to better control respirable coal mine dust levels in the mine. Better control over dust levels in the mine should result in MSHA inspector samples and samples currently taken under the operator bi-monthly sampling program demonstrating fewer overexposures. In turn, fewer overexposures will also reduce operators current abatement sampling costs related to such overexposures. Part 2 identifies both the increased costs of implementing the PV rule and the offsetting cost reductions that operators would realize from the reduced number of overexposures. The number of overexposures would be reduced because operators would have better mine ventilation plans as a result of implementing the proposed PV rule. In addition, Part 2 also identifies the cost savings to underground coal mine operators as a result of eliminating their current bi-monthly sampling program.

SUMMARY COSTS FOR SFSS RULE AND PV RULE

Table IV-1 presents adjusted first year costs, annualized compliance costs, annual compliance costs, and total yearly compliance costs (which are the sum of annualized costs and annual costs) for coal mine operators resulting from the proposed SFSS rule and the proposed PV rule. Table IV-1 shows the breakdown of total compliance costs for the three mine size

categories: (1) those employing fewer than 20 workers; (2) those employing 20 to 500 workers; and (3) those employing more than 500 workers. All MSHA cost estimates are presented in 1998 dollars. The total costs reported in Table IV-1, and in all other tables in this chapter, are best estimates of the projected costs based on our experience and available information. In some cases, however, our estimates may appear to deviate slightly from the sum or product of their component factors, but that is only because the component factors have been rounded in the tables for purposes of readability.

Table IV-1 shows that, with respect to only the proposed SFSS rule, annual compliance costs would be about \$1.8 million. There are no first-year-only costs (costs exclusively borne in the first year) in the SFSS rule; therefore the annual compliance costs are also equal to yearly costs. Of the \$1.8 million, all but about \$5,200 would be incurred by underground coal mine operators (the residual \$5,200 would be incurred by surface coal mine operators).

Table IV-1 also shows that, with respect to only the proposed PV rule, there would be yearly net compliance cost savings to underground coal mine operators of about \$2.04 million. Although implementing the PV rule would cost about \$4.75 million yearly, there would be offsetting yearly savings of: \$2.19 million due to reduced number of dust citations issued

by MSHA inspectors based on single, full-shift sample results and due to the elimination of associated underground operator abatement sampling; \$1.61 million due to reduced number of citations issued based on operator bi-monthly sampling results and due to the elimination of associated underground operator abatement sampling; \$2.73 million resulting from the elimination of operator bi-monthly sampling in underground mines; and \$0.27 million resulting from reduced Black Lung payouts by underground operators. These costs include total first year compliance costs of approximately \$3.53 million.

Finally, Table IV-1 shows that joint promulgation of the SFSS and PV rules would result in yearly net cost savings to operators of about \$0.25 million. Total first year compliance costs are estimated to be \$7.10 million, which would be partially offset by about \$3.45 million in compliance cost savings.

Under the proposed SFSS rule, mine operators would also incur civil penalty cost increases, which would be partially offset by the PV rule. The penalty costs associated with both proposed rules are shown in Table IV-1(a). Note that penalty costs conventionally are not considered to be a cost of a rule (and, in fact, are clearly not a compliance cost) but merely a transfer payment from a party violating a rule to the government. Therefore, the penalty costs shown in Table IV-1(a) are not included as part of the costs of the SFSS or PV rules. These

penalty costs are relevant, however, in determining the economic feasibility of these rules. Therefore, these penalty costs are considered mining industry costs associated with these rules in MSHA's evaluations of the rules' economic feasibility at the end of this chapter.

Table IV-1:

SFSS and PV Cost Summary for Coal Mine Operators *

Detail	<20 Emp.				≥20 Emp. ≤500				>500 Emp.				Total			
	Adj. First Year Costs ^a	Annual-ized Costs ^b	Annual Costs	Yearly Costs ^c	Adj. First Year Costs ^a	Annual-ized Costs ^b	Annual Costs	Yearly Costs ^c	Adj. First Year Costs ^a	Annual-ized Costs ^b	Annual Costs	Yearly Costs ^c	Adj. First Year Costs ^a	Annual-ized Costs ^b	Annual Costs	Yearly Costs ^c
UNDERGROUND COAL MINES																
SFSS - Rule Alone	\$0	\$0	\$369,457	\$369,457	\$0	\$0	\$1,403,122	\$1,403,122	\$0	\$0	\$20,769	\$20,769	\$0	\$0	\$1,793,348	\$1,793,348
PV Rule																
Compliance Costs	\$1,013,905	\$70,973	\$346,688	\$417,661	\$7,599,324	\$566,960	\$3,285,067	\$3,852,027	\$749,927	\$58,653	\$420,105	\$478,758	\$9,363,156	\$696,586	\$4,051,860	\$4,748,446
Reduced Inspector Citations ^d	\$234,374	\$16,406	-\$534,712	-\$518,306	\$746,981	\$52,289	#####	#####	\$33,603	\$2,352	-\$71,301	-\$68,949	\$1,014,958	\$71,047	#####	#####
Reduced Operator Citations ^e	\$106,512	\$7,456	-\$247,790	-\$240,334	\$596,040	\$41,723	#####	#####	\$39,325	\$2,753	-\$76,901	-\$74,148	\$741,877	\$51,932	#####	#####
Eliminate Bi-Mo. - Sampling	\$0	\$0	-\$556,538	-\$556,538	\$0	\$0	#####	#####	\$0	\$0	-\$113,712	-\$113,712	\$0	\$0	#####	#####
Black Lung Savings	\$0	\$0	-\$32,570	-\$32,570	\$0	\$0	-\$217,896	-\$217,896	\$0	\$0	-\$15,196	-\$15,196	\$0	\$0	-\$265,662	-\$265,662
Net PV Rule	\$1,354,791	\$94,835	#####	-\$930,087	\$8,942,345	\$660,972	#####	#####	\$822,855	\$63,758	\$142,995	\$206,753	\$11,119,991	\$819,565	#####	#####
SFSS & PV Rules Combined	\$1,354,791	\$94,835	-\$655,465	-\$560,630	\$8,942,345	\$660,972	-\$579,690	\$81,282	\$822,855	\$63,758	\$163,764	\$227,522	\$11,119,991	\$819,565	#####	-\$251,826
SURFACE COAL MINES																
SFSS - Rule Alone	\$0	\$0	\$1,127	\$1,127	\$0	\$0	\$4,094	\$4,094	\$0	\$0	\$0	\$0	\$0	\$0	\$5,221	\$5,221
UNDERGROUND AND SURFACE COAL MINES																
SFSS & PV Rules Combined	\$1,354,791	\$94,835	-\$654,338	-\$559,503	\$8,942,345	\$660,972	-\$575,596	\$85,376	\$822,855	\$63,758	\$163,764	\$227,522	\$11,119,991	\$819,565	#####	-\$246,605

* Data from Table IV-16, Table IV-63, Table IV-81, Table IV-100, Table IV-105, and Table IV-106. Note that these costs do not include penalty costs which are shown in Table IV-1(a).

^a For underground coal mines to comply with the PV rule, adjusted first year costs include some operating, maintenance, and replacement (OM&R) costs that are associated with the first year installation costs, but are not incurred until later years. When these later year OM&R costs are subtracted out, the adjusted first year costs borne by underground coal mines to comply with the PV rule would be \$3,526,428 rather than \$11,119,991. The adjusted first year costs by mine size, after subtracting out the later-year OM&R costs, would be \$419,028 for mines with fewer than 20 workers, \$2,836,844 for mines with 20 to 500 workers, and \$270,556 for mines with more than 500 workers. Total first year cost, including annual costs, borne by underground coal mines to comply with the PV rule would therefore be \$661,689 (-\$605,894 for mines with fewer than 20 workers, \$854,032 for mines with 20 to 500 workers, and \$413,551 for mines with more than 500 workers). Total first year costs, including annual costs, borne by underground coal mines to comply with the combined SSS and PV rules would be \$2,455,037 (-\$236,437 for mines with fewer than 20 workers, \$2,257,154 for mines with 20 to 500 workers, and \$434,320 for mines with more than 500 workers). Total first year costs, including annual costs, borne by all coal mines, both underground and surface, to comply with the combined SSS and PV rules would be \$2,460,258 (-\$235,310 for mines with fewer than 20 workers, \$2,261,248 for mines with 20 to 500 workers, and \$434,320 for mines with more than 500 workers).

^b One-time costs were annualized using a (real) annual discount rate of 7 percent, applied over the economic life specific to that investment.

^c Yearly costs equals annualized costs plus annual costs.

^d Reduced costs related to: (1) reduction in citations issued based on MSHA inspector sample results due to better mine ventilation plans arising from PV rule, and (2) reduction in abatement sampling and associated costs due to elimination of bi-monthly operator sampling.

^e Reduced costs related to: (1) reduction in citations issued based on operator sample results due to better mine ventilation plans arising from the PV rule, and (2) reduction in abatement sampling and associated costs due to elimination of operator bi-monthly sampling.

Table IV-1(a)
SFSS and PV Annual Penalty Cost Summary *

Detail	Yearly Penalties			
	< 20 Emp.	≥20 Emp. <500	> 500 Emp.	Total
UNDERGROUND COAL MINES				
SFSS - Rule Alone - Increase	\$20,499	\$176,339	\$1,818	\$198,656
PV Rule				
Reduced Inspector Citations	-\$28,468	-\$202,334	-\$5,263	-\$236,065
Reduced Operator Citations	-\$13,309	-\$160,956	-\$4,960	-\$179,225
Sub-total PV Rule - Reduction	-\$41,777	-\$363,290	-\$10,223	-\$415,290
Net Reduction	-\$21,278	-\$186,951	-\$8,405	-\$216,634
SURFACE COAL MINES				
SFSS - Rule Alone - Increase	\$181	\$840	\$0	\$1,021

* Data from Table IV-16(a), Table IV-82, and Table IV-101.

METHODOLOGY

In determining the effects of the proposed rules, MSHA estimated the following, as appropriate: (1) one-time or intermittent costs; (2) annualized costs (one-time or intermittent costs amortized over a specific number of years); and (3) annual costs. One-time costs are those that are incurred once and do not recur annually. Intermittent costs are those that occur from time to time, but not annually. Examples of one-time or intermittent costs are capital expenditures, such as the cost of purchasing compliance equipment, and the cost of developing and writing a ventilation plan. For the purposes of this analysis, one-time costs have been amortized using a (real) discount rate of 7%, as required by the U. S. Office of Management and Budget (OMB), over an infinite (or, at least, indefinite) period using the formula:

$$a = (i * (1 + i)^n) / ((1 + i)^n - 1),$$

where "a" is the annualization factor, "i" is the discount rate, and "n" is the economic life of the one-time investment. As "n" becomes large, the value of "a" approaches the discount rate. Therefore, for one-time costs with an infinite life, MSHA has applied an annualization factor equal to the discount rate of 7% (that is, the annualized cost is equal to 7% of the one-time

cost). Unless otherwise specified, all first year costs in this PREA were annualized using a 7 percent annualization factor.

Converting one-time costs to annualized costs allows them to be added to annual costs in order to compute the total yearly costs of a rule. Annual costs are costs that normally recur annually.²⁵ Two examples of annual costs are (annual) refresher training costs and recordkeeping costs.

With the exception of the certified dust technician wage rate, the labor costs used in this analysis for coal miners are based upon their 1997 wage rates inflated by 3 percent to reflect 1998 wage rates. The certified dust technician's wage rate was supplied by MSHA's Coal Mine Health Division. The wage rates used in this analysis are:

- \$26.83 per hour for a coal miner;
- \$19.00 per hour for a certified dust technician to take samples;
- \$49.79 per hour for a supervisor; and
- \$18.56 for a clerical worker.

These wage rates include benefits (which include social security, unemployment insurance, and workers' compensation), but do not reflect shift differentials or overtime pay. For convenience, MSHA will refer to miner "compensation" in this PREA

²⁵ Note that for the PV rule, some annual costs are incurred beginning with the second year after the rule takes effect. MSHA transformed these annual costs beginning in Year Two to normal annual costs (beginning in Year One) by reducing first year costs by an equal amount.

as "wages," where that term is understood to include benefits.

Many of the assumptions and estimates of cost components in this chapter rely exclusively on MSHA's own knowledge and experience. MSHA invites comments on any of these assumptions and estimates, or on any other aspect of the Agency's analysis of the costs of complying with MSHA's proposed rules.

SCOPE

The proposed SFSS rule would affect all underground and surface coal mines. There are 2,578 coal mines of which 968 are underground mines and 1,610 are surface mines.²⁶ Total employment (excluding office workers) at coal mines is 89,054, of which underground mines account for 49,007 workers, and surface mines account for 40,047.²⁷ The proposed PV rule would affect all underground coal mines but no surface mines.

For the purpose of this PREA, the Agency has broken down its analysis of each cost provision for three different mine size categories, which are composed of those mines employing:

(1) fewer than 20 workers; (2) 20 to 500 workers; and (3) more than 500 workers. This was done to realize two goals. First, under the Regulatory Flexibility Act (RFA) MSHA is required to

²⁶ These estimates include mines that are in non-producing status for some part of the year. However, in the analysis of the costs of the proposed PV rule in Chapter IV, only MMUs in producing status during a certain period were used to determine compliance costs.

²⁷ U.S. Dept. of Labor/MSHA - 1997 MIS Data CM441 Report, cycle 1997/184.

use the Small Business Administration (SBA) definition of a small entity. The SBA defines a small entity in the mining industry as an establishment with 500 or fewer workers (13 CFR 121.201). Almost all of the coal mines affected by this rulemaking fall into this category. Second, however, the Agency has traditionally examined the impact of its proposed rules on what the mining community refers to as "small mines" - those with fewer than 20 workers. These small mines differ from larger mines not only in the number of employees, but also, among other things, in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Thus, combining the two smallest mine size categories (fewer than 20 workers, and 20 to 500 workers) allows MSHA's analysis to comply with its RFA requirements, while the smallest category (fewer than 20 workers) allows MSHA to continue the Agency's traditional look at "small mines."

PART 1 - ESTIMATED COMPLIANCE COSTS FOR CITATIONS ISSUED BASED ON MSHA INSPECTOR SFSS RESULTS

In this part, compliance costs are estimated for the proposed SFSS rule alone, under the assumption that the proposed PV rule has not (yet) been promulgated. Therefore, many of the SFSS costs will be offset in Part 2, where the cost impacts of the proposed PV rule are estimated.

As previously indicated, the proposed SFSS rule would result

in an increase in the number of citations issued based on MSHA inspector sample results to underground and surface coal mine operators. These additional citations occur because MSHA inspectors would issue citations based on the results of a single, full-shift sample rather than the averaging of results of multiple samples taken on a shift, which can obscure cases of overexposure. Costs associated with these additional citations are related to:

- taking corrective action(s) in order to get back into compliance;
- performing abatement sampling;
- completing dust data cards;
- sending abatement samples to MSHA for processing;
- posting the results of abatement sampling; and
- paying civil penalties associated with the citations.

In underground coal mines there are several different sampling categories for which inspectors take samples. These are: designated and non-designated occupations or areas associated with a mechanized mining unit (referred to herein as MMUs); roof bolter designated areas (RB-DA); intake designated areas (I-DA); outby designated areas (O-DA); designated work positions (DWP) and non-designated work positions (NDWP); and part 90 miners (P90). The DWP and NDWP samples are taken at

surface areas of underground mines. In surface coal mines, inspectors sample DWP and/or NDWP categories. A part 90 miner is one who has shown evidence of the development of Coal Workers' Pneumoconiosis (CWP) and has opted to work in a low dust area of the mine.

Table IV-2 presents the number of additional citations annually, by mine size, that MSHA expects to issue as a consequence of the Agency's inspectors making noncompliance determinations based on the results of a single full-shift sample, rather than on the average of multiple sample results. The number of additional citations in Table IV-2 was derived from an MSHA Coal Mine Health Division analysis that compares the number of citations issued by MSHA inspectors based on the single, full-shift sample method and based on averaging. For underground mines, all three mine size categories would have an increase in the number of citations. However, for surface mines, only two mine size categories (mines that employ fewer than 20 workers and mines that employ 20 to 500 workers) would experience an increase in the number of citations.

**Table IV-2: Additional Citations Issued Annually
as a Result of MSHA Inspectors Basing Noncompliance Determinations
on Single, Full-Shift Samples Rather than on
Averaging the Results of Multiple Samples**

Additional Citations ^a								
Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	53	65	0	1	1	0	0	120
≥20 emp. ≤500	247	150	0	14	2	0	18	431
>500 emp.	6	0	0	0	0	0	0	6
Ug. Total	306	215	0	15	3	0	18	557
Surface Coal Mines^b								
<20 emp.	0	0	0	0	0	1	0	1
≥20 emp. ≤500	0	0	0	0	0	0	3	3
>500 emp.	0	0	0	0	0	0	0	0
Surf. Total	0	0	0	0	0	1	3	4

^a Citation numbers in the table were supplied by MSHA's Coal Mine Health Division and are the contained in the docket of the proposed PV rule.

^b Samples at surface coal mines are only taken at DWP and NDWP areas.

MSHA used the ratio of longwall MMUs to non-longwall MMUs, first presented in Table IV-18, to determine how many additional citations in Table IV-2 would be issued at non-longwall and longwall MMUs. However, based on MSHA experience, the Agency assumed the citation rate per MMU to be twice as high for longwall MMUs as for non-longwall MMUs. The number of citations associated with longwall and non-longwall mines reflects the Agency's assumption noted above. Table IV-3 shows the number of additional citations by mine size category that would be issued at non-longwall and longwall MMUs.

**Table IV-3: Additional Citations Issued Annually
by Mine Size Category
and Non-longwall and Longwall MMUs
due to SFSS Rule²⁸**

Mine Size	No. of Additional Citations
Underground Coal Mines	
<20 emp.	120
≥20 emp. ≤500 no lgwl	378
≥20 emp. ≤500 lgwl	53
Sub-Total	431
>500 emp. no lgwl	5
>500 emp. lgwl	1
Sub-total	6
Total Annual Additional Citations	557
Surface Coal Mines	
<20 emp.	1
≥20 emp. ≤500 emp.	3
>500 emp.	0
Total Annual Additional Citations	4

²⁸ There are no longwall operations in any underground coal mines employing fewer than 20 workers or in any surface coal mine.

Corrective Action Annual Costs Related to Additional SFSS citations

After a coal mine operator receives a citation for noncompliance based on an MSHA inspector's single full-shift sample result, the operator may need to take corrective actions. Corrective actions are adjustments made to existing dust controls and/or the mining process by the operator to abate a violation.

A variety of corrective actions can be taken in order to abate a SFSS citation. Some corrective actions are more costly than others. Some involve minor costs such as repeating maintenance tasks that are already routinely performed by the mine operator. In general, corrective actions for abating an SFSS citation concentrate on the following types of engineering controls: isolation, ventilation, water/dust suppression, and dust collection. Within each of these areas the costs of the corrective action vary because there is no single solution that fits every situation.

Table IV-4 shows examples of corrective actions (along with cost ranges) that could be implemented by a non-longwall mine operator to abate a SFSS citation. Table IV-5 shows examples of corrective actions (along with cost ranges) that could be implemented by a longwall mine operator to abate a SFSS citation.

Table IV-4: Corrective Actions and Costs
Involving Engineering Controls
to Abate a SFSS Citation at Non-longwall Mines

Type of Action	Cost Range
Ventilation changing air flow installing or repositioning curtains	\$50 to \$1,000
Water/Dust Suppression adjusting the number and/or location of water sprays adjusting type, flow, or pressure of a water spray applying wetting agents wetting down roadways	\$50 to \$2,500
Dust Collection changing scrubber screen size on a machine repairing or replacing dust collector on roof bolter	\$300 to \$900

Table IV-5: Corrective Actions and Costs
Involving Engineering Controls
to Abate a SFSS Citation at Longwall Mines

Type of Action	Cost Range
Isolation installing a remote control device on a machine enclosing the headgate gate on a longwall panel	\$500 to \$1,000
Ventilation changing air flow adjusting belt air installing or repositioning curtains installing gob curtains in mines with longwalls installing a shearer-clearer system for a longwall	\$50 to \$3,000
Water/ Dust Suppression adjusting the number and/or location of water sprays adjusting type, flow, or pressure of a water spray applying wetting agents wetting down roadways washing down shields in mines with longwalls	\$50 \$3,000

MSHA assumes that, in many cases where corrective actions are taken, the mine operators would not incur compliance costs

that are unique to the proposed rules. Often, the overexposure which is the basis for the citation can be corrected by carrying out tasks, such as keeping water sprays and scrubbers clean, and making sure that line curtains are hung correctly. These corrective actions are performed routinely by mine operators as part of a good maintenance program. At other times, an overexposure may result because a miner was not following proper work practices and was positioned incorrectly during the shift. In this case, the corrective action would be to follow proper work procedures on every shift. This corrective action would not involve any additional compliance costs to the mine operator. MSHA estimates that corrective actions involving compliance costs unique to these proposed rules would be required to abate 40 percent of the additional citations issued at non-longwall underground and surface coal mines and to abate 60 percent of the additional citations issued at underground longwall mines.

For operators that take some form of corrective action unique to the proposed SFSS rule, MSHA assumes the following corrective actions would be taken to abate MMU and R-DA citations in non-longwall underground coal mines: 50 percent would involve ventilation, costing between \$50 and \$1,000 (for an average of \$525); 75 percent would involve water/dust suppression, costing between \$50 and \$2,500 (for an average of \$1,275); and 50 percent would involve dust collection, costing between \$300 and \$900 (for

an average of \$600). MSHA assumes that more than one corrective action would normally be required to abate a citation. This explains why the sum of the above percentages exceeds 100 percent. On average, the cost to abate an MMU or RB-DA citation in a non-longwall mine is estimated to be $\$1,519 = (0.5 \times \$525) + (0.75 \times \$1,275) + (0.5 \times \$600)$. The cost of these corrective actions per MMU or R-DA citation does not appear to vary by mine size. These corrective actions would also generate an associated stream of annual operating, maintenance, and replacement (OM&R) costs. MSHA estimates that these OM&R costs each year would be equal to approximately 25 percent of the original installation costs.²⁹

For operators that take some form of corrective action unique to the proposed SFSS rule, MSHA assumes the following corrective actions would be required to abate MMU and RB-DA citations in longwall underground coal mines: 20 percent would involve isolation, costing between \$500 and \$1,000 (for an average of \$750), 25 percent would involve ventilation, costing between \$50 to \$3,000 (for an average of \$1,525); and 100 percent would involve water/dust suppression, costing between \$50 and \$3,000 (for an average of \$1,525). Therefore, on average, the

²⁹ The discounted present value of the annual OM&R costs is equal to:

$$S = \sum_{i=1}^{\infty} (0.25 \times C) / (1 + 0.07)^i$$

where C is the cost of installing the corrective action, 0.07 is the discount rate, and i represents the nth year after the proposed rule takes effect. This equation for S can be simplified to equal $(0.25 \times C / 0.07)$.

cost to abate an MMU or RB-DA citation in a longwall mine is estimated to be $\$2,056 = (0.2 \times \$750) + (0.25 \times \$1,525) + (1 \times \$1,525)$. These corrective actions would also generate an associated stream of annual OM&R costs, where these costs each year would be equal to approximately 25 percent of the original installation costs.

About 94 percent of the estimated additional citations to be issued in underground coal mines affect MMU and R-DA entities. The remaining 6 percent (or 36 additional citations) are associated with I-DA, O-DA, P-90, DWP and NDWP entities. On average, MSHA estimates that the cost of the corrective actions to abate the remaining 6 percent of citations would be about \$200 per citation for mines that employ fewer than 20 workers, and about \$400 for mines that employ 20 or more workers. These costs would apply whether or not the citation occurred in a non-longwall mine or longwall mine. These corrective actions would also generate an associated stream of annual OM&R costs, where these costs each year would be equal to approximately 25 percent of the original installation costs.

For surface coal mines, MSHA estimates that 4 additional citations would be issued as a result of the proposed SFSS rule. The cost to abate a citation is estimated to be about \$200 for mines that employ fewer than 20 workers, and about \$400 for mines

that employ 20 or more workers.³⁰ Again these corrective actions would also generate an associated stream of annual OM&R costs, where the costs each year would be approximately 25 percent of the original installation costs.

Based on the preceding information, Table IV-6 shows the costs to be incurred by underground and surface coal mine operators to abate the additional citations. MSHA requests comments on the above discussion concerning the estimated corrective actions and their associated cost ranges.

³⁰ Note that there are no longwalls in surface mining.

Table IV-6: Total Annual Corrective Action Costs
Related to the Additional SFSS Citations

Coal Mines (Mine size)	No. of Additional MMU & RB-DA Citations ^a	No. of All Other Additional Citations ^a	MMU & RB-DA Corrective Action Costs (per Citation) ^b	Other Citations Corrective Action Costs (per Citation) ^c	Total Annual Costs ^d
Underground Mines					
<20 emp.	47.2	0.8	\$6,944	\$914	\$328,488
>20 emp. <500 no lgwl	139.6	11.6	\$6,944	\$1,829	\$990,594
>20 emp. <500 lgwl	28.8	3.0	\$9,399	\$1,829	\$276,173
Sub-total	168.4	14.6			\$1,266,767
>500 emp. no lgwl	2	0	\$6,944	\$1,829	\$13,888
>500 emp. lgwl	0.6	0	\$9,399	\$1,829	\$5,639
Sub-total	2.6	0			\$19,527
Total Ug. Annual Costs					\$1,614,782
Surface Mines					
<20 emp.	0	0.4	\$0	\$914	\$366
>20 emp. <500	0	1.2	\$0	\$1,829	\$2,194
>500 emp.	0	0	\$0	\$0	\$0
Total Surf. Annual Costs					\$2,560

^a Assumes that 40 percent of citations in non-longwall mines from Table IV-3 would involve corrective actions and 60 percent of citations in longwall mines from Table IV-3 would involve corrective action. The relative share of MMU & RB-DA citations to I-DA, O-DA, and P-90 citations was derived from Table IV-2.

^b For non-longwall MMUs & RB-DAs \$6,944 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$1,519 = $(0.50 \times \$525) + (0.75 \times \$1,275) + (0.50 \times \$600)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For longwall MMUs & RB-DAs \$9,399 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective of action \$2,056 = $(0.20 \times \$750) + (0.25 \times \$1,525) + (1 \times \$1,525)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^c For other citations in ug. non-longwall mines and surface mines employing fewer than 20 workers:
\$914 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$200; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For other citations in ug. Longwall mines and surface mines employing 20 to 500 workers:
\$1,829 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$400; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^d Cost formula = (no. of additional MMU & RB-DA citations x MMU & RB-DA correction action costs) + (no. of other additional citations x other citations corrective action costs).

Existing §§ 70.201(d), 71.201(d), & 90.201(d)
Abatement Sampling Annual Costs Related to Additional SFSS
Citations

In order to abate a citation issued based on an MSHA inspector sample result, the mine operator must take corrective action and then conduct sampling. The operator must sample each production shift until 5 samples are taken. For each abatement sample taken, the operator fills out information about the sample on a dust data card and sends it, along with the sample, to MSHA's laboratory for analysis. MSHA analyzes the abatement samples to determine whether the operator is back in compliance with the applicable dust standard. If the average dust concentration is at or below the applicable standard, MSHA considers the violation to be abated and then terminates the citation. (Henceforth, for purposes of discussion, this process of averaging 5 sample results will be referred to as the averaging method). Although MSHA inspectors would cite on the basis of a single, full-shift sample result, under the regulation currently in effect, the mine operators' abatement samples would continue to be averaged to determine if the operator is complying with the applicable dust standard.

If the first set of 5 abatement sample results indicate continued noncompliance, then the abatement period may be extended by MSHA to allow the operator more time to take further corrective actions. After corrective actions are made, the

operator must take a second set of 5 abatement samples to demonstrate compliance with the applicable dust standard. This process of abating a dust violation continues until the average of the operator's 5 abatement sample results show compliance with the applicable dust standard. If, during this process, the MSHA inspector has a credible reason to believe that an operator has not made a good faith effort to correct the problem, the inspector may not extend the time for abatement and, instead, will issue a closure order, causing all mining activity to cease immediately in the affected area. For the purpose of determining the abatement sampling costs related to the additional citations, this analysis assumes that operators are able to come back into compliance based on the results of the first set of 5 abatement samples. This is consistent with MSHA experience under the Interim Single Sample Enforcement Policy (ISSEP).

It should be noted that abatement sampling costs are not the same for all coal mine operators. Some operators perform their own sampling using their own sampling equipment. Others may use rented sampling equipment to perform their sampling. Finally, some operators contract out their sampling to independent contractors who perform such service using their (the contractors') own equipment. In this latter case, the contractors are responsible for completing the dust data cards that accompanies each sample when sent to the MSHA laboratory for

analysis. Table IV-7 shows the estimated percentage of underground and surface coal mine operators that either sample using their own equipment, sample using rented equipment, or contract out their sampling.

Table IV-7:
Percentage of all Underground and Surface Coal Mines that
Sample Under Different Methods by Mine Size and Sampling Type

Method ^a	Underground and Surface Coal Mines								
	<20 Employees			≥20 Employees ≤500			>500 Employees		
	Underg. Mines		Surface	Underg. Mines		Surface	Underg. Mines		Surface
	L/Wall	NL/Wall	Mines	L/Wall	NL/Wall	Mines	L/Wall	NL/Wall	Mines
Mines with own equip.	0	63%	45%	100%	66%	56%	100%	100%	100%
Mines renting equip.	0	33%	8%	0	30%	16%	0	0	0
Mines contracting	0	4%	47%	0	4%	28%	0	0	0
Total	0	100%	100%	100%	100%	100%	100%	100%	100%

^a Data used to derive mines in each sampling category supplied by MSHA's Coal Mine Health Division

MSHA estimates that, on average, it takes approximately 1 hour to prepare and take a sample. This 1 hour time period includes about 0.8333 hours (about 50 minutes) of a certified dust technician's time to prepare the approved sampler unit, disassemble the sampling unit, and clean the sampling unit after completion of sampling. In addition, it takes a mine supervisor 0.1666 hours (about 10 minutes) to make the required operational checks of the sampling equipment during the shift. These estimates of the time needed to take a sample were provided by MSHA's Coal Mine Health Division.

The cost to take one sample depends on who does the sampling and with whose equipment. If a mine operation samples using their own sampling equipment, then the abatement sampling cost would include the cost of the certified dust technician's and mine supervisor's sampling time, plus \$13.52 for a cassette filter. Using the time estimates noted above, the cost to take 1 sample for operators that do their own sampling using their own equipment would be about \$37.65 $[(0.8333 \times \$19) + (0.1666 \times \$49.79) + \$13.52]$.

If a mine operator performs sampling using rented equipment, then the sampling costs would consist of the costs associated with the time that it takes to perform sampling, plus a \$75 per sample fee as rental charge, which includes the cost of the filter. The \$75 per sample fee for operators that do their own

sampling using rented equipment was provided by MSHA's Coal Mine Health Division. Thus, the cost to take 1 sample by operators who do their own sampling using rented equipment is estimated to be about \$99.13 $[(0.8333 \times \$19) + (0.1666 \times \$49.70) + \$75]$.

If a mine operator contracts out the required sampling, then the cost is estimated to be \$200 per sample. This charge includes the cost of a contractor performing the sampling using their own equipment, completing the accompanying dust data cards, and mailing them, to the MSHA's laboratory for analysis. The \$200 per sample cost was also provided by MSHA's Coal Mine Health Division.

In order to obtain a sampling cost figure that recognizes the different costs associated with sampling under the various scenarios discussed above, the following were assumed (from Table IV-7) based on input from individual MSHA field offices:

(a) For underground coal mine operators that have no longwall operations and employ fewer than 20 workers: about 63 percent perform their own sampling by using their own equipment; 33 percent perform their own sampling using rented equipment; and 4 percent contract out sampling.

(b) For underground coal mine operators that have no longwall operations and employ 20 to 500 workers: about 66 percent perform their own sampling by using their own equipment; 30 percent perform their own sampling using rented equipment; and 4 percent contract out sampling.

(c) For underground coal mine operators that have longwall operations and employ 20 to 500 workers, and

for operators that employ more than 500 workers (whether or not such operators have a longwall operation), 100 percent perform their own sampling using their own equipment.

(d) For surface coal mine operators that employ fewer than 20 workers: about 45 percent perform their own sampling by using their own equipment; 8 percent perform their own sampling using rented equipment; and 47 percent contract out sampling.

(e) For surface coal mine operators that employ 20 to 500 workers: about 56 percent perform their own sampling by using their own equipment; 16 percent perform their own sampling using rented equipment; and 28 percent contract out sampling.

(f) For the surface coal mine operator that employs more than 500 workers, this operator performs its own sampling by using its own equipment.

To calculate the underground and surface coal mine operators' costs for annual abatement sampling related to the additional citations resulting from the proposed SFSS rule, Table IV-8 applies the sampling rates derived from the three different sampling methods in Table IV-7.

Table IV-8: Existing 70.201(d), 71.201(d) & 90.201(d)
Total Annual Abatement Sampling Costs Related to the Additional SFSS Citations

Mine Size	No. of Additional Citations ^a	No. of Samples Per Citation	Cost Per Sample ^b	Total Annual Costs
Underground Coal Mines				
<20 emp.	120	5	\$64.43	\$38,658
>20 emp. ≤500 no lgwl	378	5	\$62.59	\$118,287
>20 emp. ≤500 lgwl	53	5	\$37.65	\$9,977
Sub-Total	431			\$128,264
>500 emp. no lgwl	5	5	\$37.65	\$941
>500 emp. lgwl	1	5	\$37.65	\$188
Sub-Total	6			\$1,129
Total Ug. Annual Costs				\$168,051
Surface Coal Mines				
<20 emp.	1	5	\$118.87	\$594
>20 emp. ≤500	3	5	\$92.94	\$1,394
>500 emp.	0	0	\$0	\$0
Total Surf. Annual Costs				\$1,989

^a Source: Table IV-6

^b \$64.43 = (0.63 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter))+
(0.33 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$75 equip.))+
(0.04 x \$200)

\$62.59 = (0.66 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter))+
(0.30 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$75 equip.))+
(0.04 x \$200)

\$37.65 = (0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter

\$118.87 = (0.45 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter))+
(0.08 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$75 equip.))+
(0.47 x \$200)

\$92.94 = (0.56 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter))+
(0.16 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$75 equip.))+
(0.28 x \$200)

Existing §§ 70.209(c), 71.209(c) & 90.209(c)
Annual Costs for Completing Dust Data Cards Related to
Additional SFSS Citations

As noted earlier, a completed dust data card must accompany after each abatement sample that is mailed to the MSHA laboratory for analysis. The card is provided by the manufacturer of the filter cassette. The card must have an identification number identical to that on the filter cassette. On each card the operator includes information pertaining to the sample taken.

After properly completing the dust card a certified person signs the card and writes their certification number on it. MSHA estimates that it takes a certified person (normally the mine safety inspector, or an equivalent person) approximately 0.025 hours (about 1.5 minutes) to complete and sign the dust data card. The hourly wage rate of a mine safety inspector is similar to a mine supervisor's rate of \$49.79.

Table IV-9 shows underground and surface coal mine operators' annual costs for completing dust data cards that accompany the abatement samples related to additional citations. The cost for completing dust data cards by operators who contract out sampling do not appear in Table IV-9 because such costs were already accounted for earlier when deriving the additional abatement sampling costs in Table IV-8.

Table IV-9: Existing 70.209(c) & 71.209(c)
Total Annual Costs for Completing Dust Cards for
Abatement Samples Related to the Additional SFSS Citations

Mine Size	No. of Additional Citations ^a	No. of Samples Per Citation	Cost for Dust Data Card ^b	Total Annual Costs
Underground Coal Mines				
<20 emp.	120	5	\$1.19	\$717
>20 emp. ≤500 no lgwl	378	5	\$1.19	\$2,258
>20 emp. ≤500 lgwl	53	5	\$1.24	\$330
Sub-Total	431			\$2,588
>500 emp. no lgwl	5	5	\$1.24	\$31
>500 emp. lgwl	1	5	\$1.24	\$6
Sub-Total	6			\$37
Total Ug. Annual Costs				\$3,343
Surface Coal Mines				
<20 emp.	1	5	\$0.66	\$3
>20 emp. ≤500	3	5	\$0.90	\$13
>500 emp.	0	0	\$0	\$0
Total Surf. Annual Costs				\$17

^a Source: Table IV-6

^b Ug. mines <20 emp.:

$$\$1.19 = (0.63 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.33 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.04 \times \$0)$$

Ug. non-longwall mines ≥20 emp. ≤500:

$$\$1.19 = (0.66 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.30 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.04 \times \$0)$$

Ug. Non-longwall mines >500 emp. and all Ug. longwall mines:

$$\$1.24 = (1 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage}))$$

Surface mines <20 emp.:

$$\$0.66 = (0.45 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.08 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.47 \times \$0)$$

Surface mines ≥20 emp. ≤500:

$$\$0.90 = (0.56 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.16 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.28 \times \$0)$$

Existing §§ 70.209(a), 71.209(a), & 90.209(c)
Annual Costs to Send Abatement Samples and Dust Cards to
MSHA Concerning Additional SFSS Citations

Each abatement sample along with its dust data card must be transmitted by mine operators who perform their own sampling to the MSHA laboratory for analysis. For mine operators who contract out their sampling, the samples and dust data cards are transmitted to MSHA by the contractor who performs the sampling. MSHA estimates that it takes a certified dust technician about 0.0833 hours (or 5 minutes) to prepare and transmit one sample along with any relevant data to MSHA. It is estimated that the cost of postage to mail one sample is about \$0.50.

Table IV-10 shows underground and surface coal mine operators' annual costs to transmit the abatement samples and dust data cards related to the additional citations. There are no compliance costs in Table IV-10 for operators that contract out sampling to send abatement samples and dust data cards to MSHA. This is because these costs for operators that contract out sampling were already included in Table IV-8, where abatement costs related to the additional citations are derived.

Table IV-10: Existing 70.209(c) & 71.209(c)
Total Annual Costs to Transmit Abatement Samples and Dust
Cards to MSHA for Analysis Related to the Additional SFSS Citations

Mine Size	No. of Additional Citations ^a	No. of Samples Per Citation	Cost to Mail Sample to MSHA ^b	Total Annual Costs
Underground Coal Mines				
<20 emp.	120	5	\$2.00	\$1,200
>20 emp. ≤500 no lgwl	378	5	\$2.00	\$3,779
>20 emp. ≤500 lgwl	53	5	\$2.08	\$552
Sub-Total	431			\$4,331
>500 emp. no lgwl	5	5	\$2.08	\$52
>500 emp. lgwl	1	5	\$2.08	\$10
Sub-Total	6			\$62
Total Ug. Annual Costs				\$5,593
Surface Coal Mines				
<20 emp.	1	5	\$1.10	\$6
>20 emp. ≤500	3	5	\$1.50	\$22
>500 emp.	0	0	\$0	\$0
Total Surf. Annual Costs				\$28

^a Source: Table IV-6

^b For ug. mines that employ < 20 emp.:

$$\$2.00 = (0.63 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)) + (0.33 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50))$$

For ug. non-longwall mines ≥20 emp. ≤ 500:

$$\$2.00 = (0.66 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)) + (0.30 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50))$$

For ug. Non-longwall mines >500 emp. and all ug. longwall mines:

$$\$2.08 = 1 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)$$

For surface mines < 20 emp.:

$$\$1.10 = (0.45 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)) + (0.08 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50))$$

For surface mines that employ ≥20 emp. ≤500:

$$\$1.50 = (0.56 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)) + (0.16 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50))$$

Existing §§ 70.210(b), 71.210(b) & 90.210(b)
Annual Cost to Post Abatement Sample Results Related to
Additional SFSS Citations

After processing the abatement samples, MSHA provides the operator with a report of the results of sampling. Upon receiving the results, the mine operator must post this data for at least 31 days on the mine bulletin board. The 5 abatement sample results are sent back to the mine operator on one page. Thus, for each citation, one page of sample results needs to be posted. MSHA estimates that it would take a clerical worker approximately 0.1 hours (6 minutes) to copy and post the results. Photocopying costs per page are estimated to be \$0.15.

With respect to part 90 citations, existing § 90.210(b) prohibits the mine operator from posting the results of abatement sampling. Instead, a copy of the report is provided to the part 90 miner. For purposes of this cost analysis, MSHA assumes that it takes the same amount of time to provide a copy of the sampling results to the affected part 90 miner as it would to post the results on the mine bulletin board.

Table IV-11 shows underground and surface coal mine operators' annual costs to copy and post (or provide to the affected miner) results of sampling related to the additional citations.

Table IV-11: Existing 70.210(b), 71.210(b) & 90.210(b)
Total Annual Costs to Post Abatement Sample
Results that are Related to the Additional SFSS Citations

Mine Size	No. of Additional Citations ^a	Cost to Post Sample Results Per Citation ^b	Total Annual Costs
Underground Coal Mines			
<20 emp.	120	\$2.01	\$241
>20 emp. ≤500 no lgwl	378	\$2.01	\$758
>20 emp. ≤500 lgwl	53	\$2.01	\$106
Sub-Total	431		\$865
>500 emp. no lgwl	5	\$2.01	\$10
>500 emp. lgwl	1	\$2.01	\$2
Sub-Total	6		\$12
Total Ug. Annual Costs			\$1,117
Surface Coal Mines			
<20 emp.	2	\$2.01	\$4
≥20 emp. ≤500	4	\$2.01	\$8
>500 emp.	0	\$0	\$0
Total Surf. Annual Costs			\$12

^a Source: Table IV-6

^a \$2.01 = (0.1 hr. x \$18.56)+(1 pg. x \$0.15)

Existing §§ 71.300(a) & 90.300(a)
Annual Costs to Prepare and Submit Respirable Dust Control
Plan For Abated Citations Concerning Additional SFSS
Citations

An operator must prepare and submit to MSHA a respirable dust control plan after: (1) a surface coal mine operator has abated a violation of the dust standard; or (2) an underground coal mine operator has abated a part 90 dust violation. Under § 71.300(a) the operator must submit for approval a written plan that is applicable to the work position identified in the citation. Under § 90.300(a) the plan submitted by the mine operator must be designed to protect the particular part 90 miner whose work environment was found to be in violation of the applicable dust standard.

For underground coal mines, MSHA estimates only 1 additional part 90 citation in mines that employ fewer than 20 workers and 2 additional part 90 citations (1 assumed to be in a non-longwall mine and one assumed to be in a longwall mine) for mines that employ 20 to 500 workers. For surface mines, MSHA estimates that there would be 1 additional citation in mines that employ fewer than 20 workers and 3 additional citations in mines that employ 20 to 500 workers. MSHA estimates that it would take a mine supervisor an average of 3 hours to prepare and submit a dust control plan. Photocopy costs are estimated to be \$0.75 (on average, 5 pages at \$0.15 per page) and postage to mail the plan is estimated to cost \$1.

Table IV-12: Existing 71.300(a) & 90.300(a)
Total Annual Costs to Prepare and Submit Respirable Dust
Control Plan Related to the Additional SFSS Citations

Mine Size	No. of Dust Plans to Write	Cost to Write and Submit Dust Plan (Per Citation) ^a	Total Annual Costs
Underground Coal Mines			
<20 emp.	1	\$151.12	\$151
>20 emp. <500 no lgwl	1	\$151.12	\$151
>20 emp. <500 lgwl	1	\$151.12	\$151
Sub-Total	2		\$302
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
Total Ug. Annual Costs			\$453
Surface Coal Mines			
<20 emp.	1	\$151.12	\$151
>20 emp. <500	3	\$151.12	\$453
>500 emp.	0	\$0	\$0
Total Surf. Annual Costs			\$604

^a \$151.12 = [(3 hours x \$49.79) + (\$0.15 x 5 pgs.) + \$1]

Existing §§ 71.301(d) & 90.301(d)
Annual Costs to Post or Provide Copy of Respirable Dust
Control Plan Concerning Additional SFSS Citations

After MSHA approves the respirable dust control plan the mine operator must: (1) under § 71.301(d) post a copy of the approved respirable dust control plan on the mine bulletin board; and (2) under § 90.301(d), provide a copy of the approved respirable dust control plan to the affected part 90 miner.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and post the plan. For purposes of this cost analysis, MSHA assumes that it would take the same amount of time to copy the plan and provide it to the affected part 90 miner as it would to copy and post the plan. On average, the plan is estimated to be about 5 pages. Photocopying costs per page are estimated to be \$0.15.

Table IV-13 shows total operator cost to copy the plans and post them, or copy the plans and provide to affected part 90 miners.

Table IV-13: Existing 71.301(d) & 90.301(d)
Total Annual Costs to Post or Provide Miner With a Copy of the
Respirable Dust Control Plan Related to the Additional SFSS Citations

Mine Size	No. of Dust Plans	Cost to Post or Provide Dust Plans (Per Citation) ^a	Total Annual Costs
Underground Coal Mines			
<20 emp.	1	\$2.61	\$3
>20 emp. <500 no lgwl	1	\$2.61	\$3
>20 emp. <500 lgwl	1	\$2.61	\$3
Sub-Total	2		\$5
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
Total Ug. Annual Costs			\$8
Surface Coal Mines			
<20 emp.	1	\$2.61	\$3
>20 emp. <500	3	\$2.61	\$8
>500 emp.	0	\$0	\$0
Total Surf. Amnnual Costs			\$10

^a \$2.61 = (\$18.56 clerical wage rate x 0.1 hour) +
(\$0.15 copy costs x 5 pgs. per plan)

Annual Penalty Costs Related to Additional SFSS Citations

Mine operators that are cited for violation of the applicable dust standard are given a citation and are assessed a civil penalty. Even if an operator successfully abates the violation, the operator must still pay the civil penalty. The dollar amount of the penalty is not the same for every citation; its determination is based on a set of criteria presented in 30 CFR §100.3. Table IV-14 provides recent average penalties for each type of entity that was cited. These were provided by MSHA's Coal Mine Health Division.

Table IV-14: Penalty Fees for SFSS Citations

Penalty Fees ^a							
Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP
Underground Coal Mines							
<20 emp.	\$175	\$161	\$0	\$63	\$0	\$181	\$181
≥20 emp. ≤500	\$491	\$292	\$267	\$345	\$696	\$454	\$280
>500 emp.	\$303	-	-	-	-	-	-
Surface Coal Mines ^b							
<20 emp.	-	-	-	-	-	\$181	\$181
≥20 emp. ≤500	-	-	-	-	-	\$454	\$280
>500 emp.	-	-	-	-	-	\$0	\$0

^a Penalty charges provided by MSHA's Coal Mine Health Division.

^b Samples at surface coal mines taken only at DWPs and NDWPs; therefore penalties only imposed for DWPs and NDWPs.

The penalty costs in Table IV-14 were applied to the additional SFSS citations in Table IV-2 to arrive at the additional penalty costs related to the additional SFSS citations shown in Table IV-15.

Note that penalty costs conventionally are not considered to be a cost of a rule (and, in fact, are clearly not a compliance cost), but merely a transfer payment to the government from a party violating a rule. Therefore, the penalty costs shown in Table IV-15, and any other penalty costs estimated in this PREA, are not included as part of the costs of the proposed SFSS or PV rules. These penalty costs are relevant, however, in determining the economic feasibility of these rules. Therefore, these penalty costs will be considered as part of the mining industry costs associated with these rules in MSHA's evaluations of economic feasibility at the end of this chapter.

Table IV-15: Total Annual Penalty Costs Related to the Additional SFSS Citations^a

Penalty Compliance Costs ^a								
Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	\$9,275	\$10,465	\$0	\$63	\$696	\$0	\$0	\$20,499
>20 emp. < 500	\$121,277	\$43,800	\$0	\$4,830	\$1,392	\$0	\$5,040	\$176,339
>500 emp.	\$1,818	\$0	\$0	\$0	\$0	\$0	\$0	\$1,818
Ug. Total	\$132,370	\$54,265	\$0	\$4,893	\$2,088	\$0	\$5,040	\$198,656
Surface Coal Mines ^b								
<20 emp.	-	-	-	-	-	\$181	\$0	181
>20 emp. < 500	-	-	-	-	-	\$0	\$840	840
>500 emp.	-	-	-	-	-	\$0	\$0	0
Surf. Total	-	-	-	-	-	181	840	1021

^a Penalty costs derived from data in Table IV-2 and Table IV-14.

Summary of Proposed Cost Increases Related to SFSS Rule

Table IV-16 summarizes MSHA's estimate of the annual costs of complying with the proposed SFSS rule. These annual costs are associated with the additional citations to be issued under the proposed SFSS rule. Table IV-16(a) summarizes the civil penalty costs of the additional citations to be issued under the proposed SFSS rule. As previously noted, these penalty costs are not included as part of the costs of the proposed SFSS rule.

Table IV-16: Summary of Annual Costs
Related to the Additional SFSS Citations *

Estimated Costs by Category	<20	> 20 empl < 500	>500	Total
Underground Coal Mines				
Corrective Actions	\$328,488	\$1,266,767	\$19,527	\$1,614,782
Abatement Sampling	\$38,658	\$128,264	\$1,129	\$168,051
Dust Cards	\$717	\$2,588	\$37	\$3,343
Send Samples to MSHA	\$1,200	\$4,331	\$62	\$5,593
Post Sample Results	\$241	\$865	\$12	\$1,117
Prepare & Submit Dust Plan	\$151	\$302	\$0	\$453
Post or Give Dust Plan	\$3	\$5	\$0	\$8
Total	\$369,457	\$1,403,122	\$20,769	\$1,793,348
Surface Coal Mines				
Corrective Actions	\$366	\$2,194	\$0	\$2,560
Abatement Sampling	\$594	\$1,394	\$0	\$1,989
Dust Cards	\$3	\$13	\$0	\$17
Send Samples to MSHA	\$6	\$22	\$0	\$28
Post Sample Results	\$4	\$8	\$0	\$12
Prepare & Submit Dust Plan	\$151	\$453	\$0	\$604
Post or Give Dust Plan	\$3	\$8	\$0	\$10
Total	\$1,127	\$4,094	\$0	\$5,220
Underground and Surface Coal Mines				
Corrective Actions	\$328,854	\$1,268,961	\$19,527	\$1,617,342
Abatement Sampling	\$39,252	\$129,658	\$1,129	\$170,040
Dust Cards	\$720	\$2,602	\$37	\$3,359
Send Samples to MSHA	\$1,205	\$4,353	\$62	\$5,621
Post Sample Results	\$245	\$873	\$12	\$1,129
Prepare & Submit Dust Plan	\$302	\$756	\$0	\$1,058
Post or Give Dust Plan	\$5	\$13	\$0	\$18
Grand Total	\$370,584	\$1,407,215	\$20,769	\$1,798,568

* Source: Tables IV-6 through IV-13. Note that yearly costs equal annualized costs plus annual costs. Since all costs in the SFSS rule are annual costs, then yearly costs for the SFSS rule equal annual costs.

As a result of the plan verification proposed rule, mine operators would have ventilation plans designed to be more effective in controlling respirable dust. With better designed ventilation plans, MSHA anticipates also to issue fewer MMU and RB-DA citations based on the results of single, full-shift samples. There should also be a decrease in the number of I-DA, O-DA, and P-90 miner citations issued but to a lesser extent. (Since DWP and NDWP citations are issued on surface areas of underground coal mines, the PV rule should not affect the number of these citations.)

As a result, the total costs to operators associated with the additional SFSS citations discussed earlier would be offset by the proposed PV rule. The magnitude of this SFSS cost reduction is estimated in Part 2 of this chapter.

PART 2 - ESTIMATED COMPLIANCE COSTS FOR THE PROPOSED PLAN VERIFICATION (PV) RULE

PV Costs by Provision

Before deriving the cost of the proposed PV rule, the method for handling some types of costs requires explanation. In a few cases, the proposed PV rule imposes compliance costs that would be the same every year, beginning with the first year that the rule takes effect. These are "annual costs," as traditionally defined. In most cases, however, the proposed PV rule imposes costs which would be the same each year starting with the second year the PV rule is in effect, but whose first year costs would be different (and typically larger). MSHA separated these first year costs into two parts: (1) an amount equal to annual costs starting with Year 2 after the rule takes effect and (2) the residual, which we term "adjusted" first year costs.³¹ The adjusted first year costs could then be annualized and added to annual costs (all beginning in the first year the rule takes effect) in order to arrive at yearly costs. As a result, yearly costs begin in the first year that the rule takes effect and are the same every year thereafter.

³¹ A hypothetical example might help to explain this procedure. Suppose that compliance costs are \$2,000 the first year and \$400 each year thereafter. The adjustment procedure simply splits first year compliance costs into two parts: (1) \$400, for the first year of annual costs; and (2) the residual \$1,600. Consequently, adjusted first year costs would be \$1,600 and annual costs (starting in year 1) would be \$400.

How Many Rounds of Plan Verification Sampling Are Anticipated to Occur

All underground coal mine operators would be required to have a verified ventilation plan. MSHA would collect full production-shift respirable dust samples, called "verification samples" in each mechanized mining unit or MMU,³² to demonstrate the adequacy of the dust control parameters specified in the mine ventilation plan. A round is the sampling of a shift or series of shifts until the required number of valid samples are collected and the resulting dust-concentration measurements are at or below the specified critical values in the proposed PV rule. If the measurements exceed the critical values then another round of sampling is needed.³³

To be considered a verification sample, the sample must be taken on a full shift during which the amount of material produced by a MMU must be at or above the verification production level (VPL). The VPL is defined in the proposed PV rule as the tenth highest production level recorded in the most recent thirty production shifts. In addition, the samples must be taken on a shift using only the engineering, environmental controls, and other measures included in the ventilation plan, at levels not

³² An MMU uses a unit of mining equipment for the production of material.

³³ For example, based on the critical values in §70.209, if any shift sample result(s) exceeds 2.0 mg/m³ for respirable coal mine dust, then another round of sampling is needed. If on the first shift sampled the operator's sample results are between 1.71 mg/m³ and 1.85 mg/m³ for respirable coal mine dust, then a second shift of sampling, within the first round, is required. If valid sample result(s) are between 1.85 mg/m³ and 1.93 mg/m³ or 1.93 mg/m³ and 2.0 mg/m³, then additional shifts of sampling, up to a maximum of four shifts, could be sampled within the first round.

exceeding 115 percent of the quantities specified in the plan. For the ventilation plan to be verified as being effective, each of the verification samples must be at or below the critical values in proposed § 70.209 and/or proposed § 70.213(b) of the PV rule, whichever is applicable. Any further reference, in this document, to the critical values in proposed § 70.209 and/or proposed § 70.213(b) will be recognized as just "critical values noted in the proposed PV rule."

Although verification sampling will be performed by MSHA and therefore is not a cost to mine operators with respect to the plan verification rule, it is still important to discuss MSHA's estimate of the number of rounds of sampling that would be required for each MMU to verify the effectiveness of the mine ventilation plan in controlling respirable dust. The number of rounds of sampling is directly related to some of the operators' plan verification compliance costs, such as revising the ventilation plan, sending the plan to MSHA for review and approval, and posting the revised ventilation plan revisions on the mine bulletin board.

Note that the following discussion focuses the number of rounds of sampling that are anticipated to verify the plan. It does not focus on the number of verification samples that need to be taken every time such sampling is conducted nor on the number of shifts needed to be sampled in order to verify the plan.

These will be addressed later as they apply to the determination of operator compliance costs.

First Year PV Rule is in Effect

During the first round of verification sampling, MSHA assumes that not all mines will be able to get valid verification samples that are at or below the critical values in the proposed PV rule. After the first round of verification sampling, some of the sample results would fail to be at or below the critical values in the proposed PV rule. Therefore, for these MMUs, a second round of verification sampling would be needed in order to obtain valid verification samples whose results are at or below the critical values in the proposed PV rule. However, MSHA further assumes that some of the MMUs involved in a second round of verification sampling will have valid verification samples that would still not meet the critical values in the proposed PV rule. Therefore, MMUs, in this situation would need a third round of verification sampling. For MMUs involved in a third round of verification sampling, MSHA assumes that all of the MMUs would obtain valid samples that would meet the critical values in the proposed rule. Therefore, MSHA assumes that no more than 3 rounds of verification sampling would be needed for any MMUs to get valid verification samples that would be at or below the critical values listed in the proposed rule. Thus, no MMU is

assumed to need a fourth round of verification sampling when originally verifying their mine ventilation plan.

The failure rate percentages for MMUs involved in a first, second, and third round of verification sampling are shown in Table IV-17. MSHA requests comments on the failure rate percentages, shown in Table IV-17, which are used to develop MSHA's estimates of verification sampling frequency.

Table IV-17: Failure Schedule for the First Year That Plan Verification Rule is in Effect

Ug. Coal Mines Verification Process	Non-Longwall MMUs in Mines That Employ <20 Workers ^a	Non-Longwall MMUs in Mines That Employ ≥20 & ≤500 Workers ^b	Longwall MMUs in Mines That Employ ≥20 & ≤500 Workers ^c	Non-Longwall MMUs in Mines That Employ >500 Workers ^d	Longwall MMUs in Mines That Employ >500 Workers ^e
1st Round	211	691	45	30	7
Percentage of MMUs that Fail After Each Attempt to Reverify					
Fail 1st Round (need 2nd Round)	25%	25%	66%	25%	60%
Fail 1st & 2nd Rounds (need 3rd Round)	7%	7%	75%	7%	75%
Fail 1, 2, & 3rd Rounds (need 4th Round)	0%	0%	0%	0%	0%
Number of MMUs That Fail Based on Above Percentages					
Fail 1st Round (need 2nd Round)	53	173	30	8	4
Fail 1st & 2nd Rounds (need 3rd Round)	4	12	22	1	3
Fail 1, 2, & 3rd Rounds (need 4th Round)	0	0	0	0	0

Source: Percentages provided by MSHA's Coal Mine Health Division.

^a There are no longwall operations in mines employing fewer than 20 workers.

^b For mines with longwall operations, this category includes the continuous mining units that support the longwall operation but does not include the actual longwall operation.

^c The MMUs in this category contain only the actual longwall operations in longwall mines.

^d For mines with longwall operations, this category includes the continuous mining units that support the longwall operation but does not include the actual longwall operation.

^e The MMUs in this category contain only the actual longwall operations in longwall mines.

The data in Table IV-17 can be interpreted in the following manner:

(1) All 211 MMUs in underground coal mines employing fewer than 20 workers would verify their ventilation plans in the first year the rule takes effect. Of these, it is estimated that 25 percent (53 MMUs) would have valid verification samples that fail to be at or below the critical values noted in the proposed PV rule on the first round and therefore a second round of verification sampling would be needed. Seven percent of those that failed the first time would fail again the second time (4 MMUs) and a third round of verification sampling would be needed.

(2) All 691 MMUs in non-longwall and longwall underground coal mines employing 20 to 500 workers would need to verify their ventilation plans in the first year that the rule takes effect. Of these, 25 percent (173 MMUs) would have valid verification samples that fail to be at or below the critical values noted in the proposed rule on the first round and therefore a second round of verification sampling would be needed. Seven percent of those that failed the first time would fail again the second time (12 MMUs) and a third round of verification sampling would be needed.

(3) There are an additional 45 MMUs in longwall underground coal mines employing 20 to 500 workers that would need to verify their ventilation plans in the first year that the rule takes effect. Of these, 66 percent (30 MMUs) would have valid verification samples that fail to be at or below the critical values noted in the proposed PV rule on the first round and therefore a second round of verification sampling would be needed. Seventy-five percent of those that failed the first time would fail again the second time (22 MMUs) and a third round of verification sampling would be needed. For the 22 MMUs involved in a third round of verification sampling MSHA assumes that, in order to get valid verification samples that are at or below the critical values noted in the proposed PV rule, about twenty-five percent (5 MMUs) would need to have miners use administrative controls, while the remaining 75 percent (17 MMUs) would need to have miners on the MMUs use powered air purifying respirators (PAPRs).

(4) There are 30 MMUs in non-longwall underground coal mines employing more than 500 workers that would need to verify their ventilation plans in the first year that the rule takes effect. Of these, 25 percent (8 MMUs) would have valid verification samples that fail to be at or below the critical values noted in the proposed PV rule on the first round and therefore a second round of verification sampling would be needed. Seven percent of those that failed the first time would fail again the second time (1 MMU) and a third round of verification sampling would be needed.

(5) There are an additional 7 MMUs in longwall underground coal mines employing more than 500 workers that would verify their ventilation plans in the first year that the rule takes effect. Of these, 60 percent (4 MMUs) would have valid verification samples that fail to be at or below the critical values noted in the proposed PV rule on the first round and therefore a second round of verification sampling would be needed. Seventy-five percent of those that failed the first time would fail again the second time (3 MMUs) and a third round of verification sampling would be needed. For the 3 MMUs involved in a third round of verification samples, MSHA assumes that, in order to get valid verification samples that are at or below the critical values noted in the proposed PV rule, they would need to use PAPRs.

First Year Re-Verification Under PV Rule

All MMUs will need to have a verified ventilation plan in the first year of the PV rule. This was explained above in the context that MMUs would need either a first, second or third round of verification sampling. However, even after MSHA has verified the ventilation plans, some of them will still need to be re-verified in the first year because of subsequent violations (presumably due to changes in operating conditions). With respect to these MMUs that need to have their ventilation plans

re-verified, the following would apply.

Of the total citations issued based on an MSHA inspector sample result, 90 percent are assumed to be eliminated as a result of an improved ventilation plan resulting from the PV rule. However, the first year of the PV rule will be a transition year. MSHA assumes that, on average, during the first year of the PV rule only half of the MMUs will have a verified plan at any point. Therefore, in the first year of the PV rule, only half of the 90 percent of citations (or 45%) are expected to be eliminated. Therefore, during the first year of the PV rule 55 percent of the citations are estimated to remain. Of these 55 percent of citations, 10 percent are assumed to be associated with MMUs that will require re-verification in the first year of the rule.

Of the total citations issued based on current operator bi-monthly sample results, 90 percent are assumed to be eliminated as a result of the PV rule. However, by similar reasoning, in the first year of the PV rule, only half of these 90 percent of citations (or 45%) are expected to be eliminated. Therefore, during the first year of the PV rule 55 percent of these citations are estimated to remain. Of these 55 percent of citations, 10 percent are assumed to be associated with MMUs that will require re-verification in the first year of the rule.

Table IV-18 below shows MSHA's estimate of the number of

MMUs that would need ventilation plans re-verified in the first year.

Table IV-18
Number of MMUs That Will Need to Re-verify Ventilation Plans in the First Year of the PV Rule

Mine Size by Emp.	Inspector Citations from Table IV-64 ^a	Bi-Monthly Citations from Table IV-83 ^b	Inspector Citations Remaining in 1 st Year of PV Rule ^c	Bi-Monthly Citations Remaining in 1 st Year of PV Rule ^d	Total Remaining Citations in 1 st Year of PV Rule ^e	Total Citations where MMU Must be Re-verified ^f
<20	190	89	105	50	155	15
≥20&≤500 (no lgwl)	481	406	265	223	488	49
≥20&≤500 (lgwl)	66	41	36	23	59	6
Sub-Total	547	447	301	246	547	55
≥500 (no lgwl)	14	9	8	5	13	1
≥500 (lgwl)	6	10	3	6	9	1
Sub-Total	20	19	11	11	22	2
Total	757	555	417	307	724	72

^a Figures reflect 100% of citations issued based on an inspector sample result, which includes additional SFSS citations.

^b Figures reflect 100% of citations issued based on operator bi-monthly sample results.

^c MSHA assumes that, when all mines have verified their plans the PV rule will eliminate 90% of all citations issued based on an inspectors sample result. However, during the first year that the PV rule is in effect, only half of the 90% would be eliminated (or 45%). Thus, 55% of such citations would remain during the first year.

^d MSHA assumes that the PV rule will eliminate 90% of all citations issued based on operator bi-monthly sample results.

However, during the first year that the PV rule is in effect, only half of the 90% would be eliminated (or 45%). Thus, 55% of such citations would remain during the first year.

^e Sum of citations issued based on inspector sample results and citations issued based on operator bi-monthly sample results.

^f Figures are 10% of total remaining citations in 1st year of PV rule. For each of these citations, the MMU will have to re-verify its plan.

Subsequent Years PV Rule is in Effect

After the first year, re-verification of the ventilation plan could be required if an MSHA sample result showed non-compliance or if the mining conditions have significantly changed. On average, MSHA assumes that in subsequent years, after the first year of the rule, about 25 percent of MMUs in each category presented in Table IV-17 listed by the heading "1st Round" would need to re-verify the ventilation plans. This 25 percent annual rate was supplied by the technical staff of MSHA's Coal Mine Health Division.

Existing § 75.370 Pursuant to Proposed § 70.203(a)
Costs to Write a Revised Mine Ventilation Plan

As stated earlier, the number of rounds of verification sampling during the first year the proposed PV rule is in effect and for every year thereafter is important because this information is directly related to certain mine operator plan verification compliance costs. For example, MSHA assumes for costing purposes that before a round of verification sampling occurs mine operators will have to revise their ventilation plans, send the plans to MSHA, and post them on the mine bulletin board.

As a result of the proposed PV rule, MSHA assumes that all underground coal mine operators would need to revise their mine ventilation plans before verification sampling can be conducted

under existing § 75.370. On average, MSHA estimates that such a revision would take a mine supervisor about 5 hours for operators that employ fewer than 20 workers, 6 hours for operators that employ 20 to 500 workers, and 7 hours for operators that employ more than 500 workers.

Table IV-19 shows underground coal mine operators' first year costs for writing revised ventilation plans, where such costs are associated with the first, second, and third rounds of original verification noted in Table IV-17.

Table IV-20 below shows first year costs for operators to revise ventilation plans for MMUs that need to re-verify their ventilation plans in the first year of the PV rule.

Table IV-21 combines all first year costs to show the total adjusted first year and annualized costs for operators to revise their ventilation plans.

Table IV-19: Existing 75.370 Pursuant to Proposed 70.203(a)
First Year Costs to Write Revised Ventilation Plan

Ug. Coal Mine Size	MMUs	Revised Plan Per MMU Costs ^a	Revised Plan Costs 1st Round	Revised Plan Costs 2nd Round ^b	Revised Plan Costs 3rd Round ^b	First Year Costs
<20 emp.	211	\$248.95	\$52,528	\$13,132	\$919	\$66,580
>20 emp. ≤500 no lgwl	691	\$298.74	\$206,429	\$51,607	\$3,613	\$261,649
>20 emp. ≤500 lgwl	45	\$298.74	\$13,443	\$8,873	\$6,654	\$28,970
Sub-total	736		\$219,873	\$60,480	\$10,267	\$290,619
>500 emp. no lgwl	30	\$348.53	\$10,456	\$2,614	\$183	\$13,253
>500 emp. lgwl	7	\$348.53	\$2,440	\$1,464	\$1,098	\$5,001
Sub-total	37		\$12,896	\$4,078	\$1,281	\$18,254
Total First Year Costs			\$285,297	\$77,690	\$12,467	\$375,454

^a Cost per MMU = (r x \$49.79); where r is the number of hours estimated for a supervisor to revise a ventilation plan, and r=5 in mines that employ <20 workers, r=6 in mines that employ between 20 and 500 workers, and r=7 in mines that employ more than 500 workers; and \$49.79 is the hourly wage rate for a coal mine supervisor.

^b Dollars derived by multiplying percentages in Table IV-17 by costs found under the heading "Revised Plan Costs 1st Round".

Table IV-20: Existing 75.370 Pursuant to Proposed 70.203(a)
First Year Costs to Write Revised Ventilation Plan
(For Those MMUs That Must Re-Verify Their Ventilation Plan)

Ug. Coal Mine Size	MMUs ^a	Revised Plan Per MMU Costs ^b	First Year Costs
First Year Costs			
<20 emp.	15	\$248.95	\$3,734
≥20 emp. ≤500 no lgwl	49	\$298.74	\$14,638
≥20 emp. ≤500 lgwl	6	\$298.74	\$1,792
Sub-total	55		\$16,431
>500 emp. no lgwl	1	\$348.53	\$349
>500 emp. lgwl	1	\$348.53	\$349
Sub-total	2		\$697
Total First Year Costs			\$20,862

^a Number of MMUs from Table IV-18.

^b Cost per MMU = (r x \$49.79); where r is the number of hours estimated for a supervisor to revise a ventilation plan, and r=5 in mines that employ <20 workers, r=6 in mines that employ between 20 and 500 workers, and r=7 in mines that employ more than 500 workers; and \$49.79 is the hourly wage rate for a coal mine supervisor.

Table IV-21: Existing 75.370 Pursuant to Proposed 70.203(a)
Total First Year and Annualized Costs to Write Revised Ventilation Plan

Ug. Coal Mine Size	First Year Costs ^a	Annual Costs ^b	Adjusted First Year Costs ^c	Adjusted First Year Cost Annualized ^d
Adjusted First Year Costs Annualized				
<20 emp.	\$70,314	\$13,194	\$57,120	\$3,998
>20 emp. ≤500 no lgwl	\$276,287	\$51,682	\$224,605	\$15,722
>20 emp. ≤500 lgwl	\$30,763	\$3,286	\$27,477	\$1,923
Sub-total	\$307,050	\$54,968	\$252,082	\$17,646
>500 emp. no lgwl	\$13,601	\$2,788	\$10,813	\$757
>500 emp. lgwl	\$5,350	\$697	\$4,653	\$326
Sub-total	\$18,951	\$3,485	\$15,466	\$1,083
Total Annualized costs	\$396,316	\$71,648	\$324,668	\$22,727

^a A sum of costs from Table IV-19 and Table IV-20.

^b An amount equivalent to annual costs from Table IV-22.

^c Adjusted first year costs equal total first year costs minus first year of annual costs

^d Adjusted total first year costs annualized equals adjusted first year costs times 0.07, where 0.07 is the annualization factor.

After the first year, MSHA assumes that each year 25 percent, on average, of all sampled MMUs would need to have their ventilation plans re-verified as a result of proposed § 70.203. Table IV-22 shows the underground coal mine operators' annual costs (including an equivalent amount for the first year as derived in the previous table) for writing revised ventilation plans.

**Table IV-22: Existing 75.370 Pursuant to Proposed 70.203(a)
Total Annual Costs to Write Revised Ventilation Plan**

Ug. Coal Mine Size	MMUs^a	Cost to Revise Ventilation Plan Per MMU^b	Total
<20 emp.	53	\$248.95	\$13,194
>20 emp. <500 no lgwl	173	\$298.74	\$51,682
>20 emp. <500 lgwl	11	\$298.74	\$3,286
Sub-total	184		\$54,968
>500 emp. no lgwl	8	\$348.53	\$2,788
>500 emp. lgwl	2	\$348.53	\$697
Sub-total	10		\$3,485
Total Annual Costs			\$71,648

^a Numbers reflect 25% of MMUs (from Table IV-19).

^b Revised Ventilation Plan Costs per MMU (same as in Table IV-19).

Existing § 75.370(a)(2) and (a)(3)(i)
Costs to Copy and Send Revised Ventilation Plan to MSHA

A copy of any revisions to the underground coal mine operator's ventilation plan would need to be sent forth to the appropriate MSHA District Manager and to the miners' representative. During the first year, all operators would initially have to submit revised ventilation plans.

MSHA estimates that a clerical worker would take 0.1666 hours (10 minutes) to copy and send in a revised ventilation plan. On average, the estimated length of a ventilation plan is assumed to be about 3 pages for an operator that employs fewer than 20 workers, and about 6 pages for an operator that employs 20 or more workers. Photocopying costs per page are estimated to be \$0.15, and postage costs are estimated to be \$1.00.

Table IV-23 shows first year costs for operators to copy and send revised ventilation plans to the MSHA District Manager and to the miners' representative, where such costs are associated with the first, second, and third rounds of the original verification of ventilation plans as noted in Table IV-17.

Table IV-24 shows first year costs to copy and send revised ventilation plans to the MSHA District Manager and to the miners' representative for MMUs that need to re-verify ventilation plans in the first year of the PV rule.

Table IV-25 combines all first year costs to show the total adjusted first year and annualized costs.

Table IV-23: Existing 75.370(a)(2) & (a)(3)(i)
First Year Costs to Copy and Send Revised Ventilation Plan

Ug. Coal Mine Size	MMUs	Copy & Send Plan Per MMU Costs ^a	Copy & Send Plan Costs 1st Round	Copy & Send Plan Costs 2nd Round ^b	Copy & Send Plan Costs 3rd Round ^b	First Year Costs
First Year Costs						
<20 emp.	211	\$9.08	\$1,917	\$479	\$34	\$2,429
≥20 emp. ≤500 no lgwl	691	\$9.98	\$6,899	\$1,725	\$121	\$8,745
≥20 emp. ≤500 lgwl	45	\$9.98	\$449	\$297	\$222	\$968
Sub-total	736		\$7,348	\$2,021	\$343	\$9,713
>500 emp. no lgwl	30	\$9.98	\$300	\$75	\$5	\$380
>500 emp. lgwl	7	\$9.98	\$70	\$42	\$31	\$143
Sub-total	37		\$369	\$117	\$37	\$523
Total First Year Costs			\$9,635	\$2,617	\$413	\$12,665

^a Cost per MMU = $((0.1666 \times \$18.56) + (\$0.15 \times p) + \$1) \times 2$, where 0.1666 hrs. is the time for a clerical worker to copy and send in ventilation plan; \$18.56 is clerical worker's hourly wage rate; \$0.15 is photocopy costs per page; p is the no. of pages to copy, p=3 for mines employing <20 workers, and p=6 for mines employing ≥ 20 workers; \$1 for postage; 2 = number of plans to mail.

^b Dollars derived by multiplying percentages in Table IV-17 by costs found under the heading "Copy and Send Plan Costs 1st Round".

**Table IV-24: Existing 75.370(a)(2) & (a)(3)(i)
First Year Costs to Copy and Send Revised Ventilation Plan
For Those MMUs That Must Re-Verify Their Ventilation Plan**

Ug. Coal Mine Size	MMUs ^a	Copy & Send Plan Per MMU Costs ^b	First Year Costs
First Year Costs			
<20 emp.	15	\$9.08	\$136
>20 emp. <500 no lgwl	49	\$9.98	\$489
>20 emp. <500 lgwl	6	\$9.98	\$60
Sub-total	55		\$549
>500 emp. no lgwl	1	\$9.98	\$10
>500 emp. lgwl	1	\$9.98	\$10
Sub-total	2		\$20
Total First Year Costs			\$705

^a Number of MMUs from Table IV-18.

^b Cost per MMU = $((0.1666 \times \$18.56) + (\$0.15 \times p) + \$1) \times 2$, where 0.1666 hrs. is the time for a clerical worker to copy and send in ventilation plan; \$18.56 is clerical worker's hourly wage rate; \$0.15 is photocopy costs per page; p is the no. of pages to copy, p=3 for mines employing <20 workers, and p=6 for mines employing ≥ 20 workers; \$1 for postage; 2 = number of plans to mail.

Table IV-25: Existing 75.370(a)(2) & (a)(3)(i)

Total First Year and Annualized Costs to Copy and Send Revised Ventilation Plan

Ug. Coal Mine Size	First Year Costs ^a	Annual Costs ^b	Adjusted First Year Costs ^c	Adjusted First Year Cost Annualized ^d
Adjusted First Year Costs Annualized				
<20 emp.	\$2,566	\$481	\$2,084	\$146
≥20 emp. ≤500 no lgwl	\$9,234	\$1,727	\$7,507	\$525
≥20 emp. ≤500 lgwl	\$1,028	\$110	\$918	\$64
Sub-total	\$10,262	\$1,837	\$8,425	\$590
>500 emp. no lgwl	\$390	\$80	\$310	\$22
>500 emp. lgwl	\$153	\$20	\$133	\$9
Sub-total	\$543	\$100	\$443	\$31
Total Annualized costs	\$13,371	\$2,418	\$10,952	\$767

^a A sum of costs from Table IV-23 and Table IV-24.

^b An amount equivalent to annual costs from Table IV-26.

^c Adjusted first year costs equal total first year costs minus first year of annual costs.

^d Adjusted total first year costs annualized equals adjusted first year costs times 0.07, where 0.07 is the annualization factor.

MSHA assumes that 25 percent of all sampled MMUs in each mine size category would need to have their plans verified each year (after the first year). MSHA assumes that each revised ventilation plan would need to be sent to the appropriate MSHA District Manager and to the miners' representative. Table IV-26 shows the underground coal mine operators' annual costs (including an equivalent amount for the first year as derived in the previous table) for sending copies of the ventilation plan to the MSHA District Manager and to the miners' representative.

**Table IV-26: Existing 75.370(a)(2) & (a)(3)(i)
Total Annual Costs to Copy and Send Revised
Ventilation Plan**

Ug. Coal Mine Size	MMUs^a	Copy & Send Plan Costs Per MMU^b	Total
<20 emp.	53	\$9.08	\$481
>20 emp. <500 no lgwl	173	\$9.98	\$1,727
>20 emp. <500 lgwl	11	\$9.98	\$110
Sub-total	184		\$1,837
>500 emp. no lgwl	8	\$9.98	\$80
>500 emp. lgwl	2	\$9.98	\$20
Sub-total	10		\$100
Total Annual Costs			\$2,418

^a Numbers reflect 25% of all MMUs (from Table IV-23).

^b Cost per MMU to copy and send revised ventilation plan per MMU
(same as in Table IV-23).

Existing § 75.370(a)(3)(iii)
Costs to Post Revised Ventilation Plan

Underground coal mine operators must post a copy of any revisions to the mine ventilation plan on the mine bulletin board. During the first year of the rule all operators would have to revise their ventilation plans for each MMU that fails the verification process, and then post the revision on the mine bulletin board. In addition, during the first year some operators would need to revise their ventilation plans again, since not all operators would verify plans on their first round. These further revisions would also have to be posted.

MSHA estimates that a clerical worker would take 0.1666 hours (10 minutes) to copy and post a revised ventilation plan. On average, the estimated length of a ventilation plan is about 3 pages for an operator that employs fewer than 20 workers, and about 6 pages for an operator that employs 20 or more workers. Photocopying costs per page are estimated to be \$0.15.

Table IV-27 shows first year costs for operators to copy and post revised ventilation plans, where such costs are associated with the first, second, and third rounds of original verification noted in Table IV-17.

Table IV-28 shows first year costs to copy and post revised ventilation plans for MMUs that need to re-verify ventilation plans in the first year of the PV rule.

Table IV-29 combines all first year costs to show the total adjusted first year and annualized costs to copy and post revised ventilation plans.

Table IV-27: Existing 75.370(a)(3)(iii)
First Year Costs to Post Revised Ventilation Plan

Ug. Coal Mine Size	MMUs	Post Plan Costs Per MMU ^a	Post Plan Costs 1st Round	Post Plan Costs 2nd Round ^b	Post Plan Costs 3rd Round ^b	First Year Costs
First Year Costs						
<20 emp.	211	\$3.54	\$747	\$187	\$13	\$947
≥20 emp. ≤500 no lgwl	691	\$3.99	\$2,759	\$690	\$48	\$3,496
≥20 emp. ≤500 lgwl	45	\$3.99	\$180	\$119	\$89	\$387
Sub-total	736		\$2,938	\$808	\$137	\$3,884
>500 emp. no lgwl	30	\$3.99	\$120	\$30	\$2	\$152
>500 emp. lgwl	7	\$3.99	\$28	\$17	\$13	\$57
Sub-total	37		\$148	\$47	\$15	\$209
Total First Year Costs			\$3,833	\$1,042	\$165	\$5,040

^a Cost per MMU = $(0.1666 \times \$18.56) + (\$0.15 \times p)$, where 0.1666 hrs. is the time for a clerical worker to copy and post ventilation plan; \$18.56 is the clerical worker's hourly wage rate; \$0.15 is photocopying costs per page; p is the number of pages to copy, p=3 for mines employing <20 workers, and p=6 for mines employing ≥ 20 workers.

^b Dollars derived by multiplying percentages in Table IV-17 by costs found under the heading "Post Plan Costs 1st Round".

Table IV-28: Existing 75.370(a)(3)(iii)
First Year Costs to Post Revised Ventilation Plan
For Those MMUs That Must Re-Verify Their Ventilation Plan

Ug. Coal Mine Size	MMUs ^a	Post Plan Costs Per MMU ^b	First Year Costs
First Year Costs			
<20 emp.	15	\$3.54	\$53
>20 emp. ≤500 no lgwl	49	\$3.99	\$196
>20 emp. ≤500 lgwl	6	\$3.99	\$24
Sub-total	55		\$220
>500 emp. no lgwl	1	\$3.99	\$4
>500 emp. lgwl	1	\$3.99	\$4
Sub-total	2		\$8
Total First Year Costs			\$281

^a Number of MMUs from Table IV-18.

^b Cost per MMU = $(0.1666 \times \$18.56) + (\$0.15 \times p)$, where 0.1666 hrs. is the time for a clerical worker to copy and post ventilation plan; \$18.56 is the clerical worker's hourly wage rate; \$0.15 is photocopying costs per page; p is the number of pages to copy, p=3 for mines employing <20 workers, and p=6 for mines employing ≥ 20 workers.

Table IV-29: Existing 75.370(a)(3)(iii)

Total First Year and Annualized Costs to Post Revised Ventilation Plan

Ug. Coal Mine Size	First Year Costs ^a	Annual Costs ^b	Adjusted First Year Costs ^c	Adjusted First Year Cost Annualized ^d
Adjusted First Year Costs Annualized				
<20 emp.	\$1,000	\$188	\$813	\$57
≥20 emp. ≤500 no lgwl	\$3,692	\$691	\$3,001	\$210
≥20 emp. ≤500 lgwl	\$411	\$44	\$367	\$26
Sub-total	\$4,103	\$735	\$3,369	\$236
>500 emp. no lgwl	\$156	\$32	\$124	\$9
>500 emp. lgwl	\$61	\$8	\$53	\$4
Sub-total	\$217	\$40	\$177	\$12
Total Annualized costs	\$5,321	\$962	\$4,358	\$305

^a A sum of costs from Table IV-27 and Table IV-28.

^b An amount equivalent to annual costs from Table IV-30.

^c Adjusted first year costs equal total first year costs minus first year of annual costs

^d Adjusted total first year costs annualized equals adjusted first year costs times 0.07, where 0.07 is the annualization factor.

MSHA assumes that each year 25 percent, on average, of all MMUs in each mine size category would need to have their plans verified (after the first year). Each revised ventilation plan would need to be posted. Table IV-30 shows the underground coal mine operators' annual costs (including an equivalent amount for the first year as derived in the previous table) to post revised ventilation plans on the mine bulletin board.

**Table IV-30: Existing 75.370(a)(3)(iii)
Total Annual Costs to Post Revised Ventilation Plan**

Ug. Coal Mine Size	MMUs^a	Post Plan Costs Per Mine^b	Total
<20 emp.	53	\$3.54	\$188
>20 emp. <500 no lgwl	173	\$3.99	\$691
>20 emp. <500 lgwl	11	\$3.99	\$44
Sub-total	184		\$735
>500 emp. no lgwl	8	\$3.99	\$32
>500 emp. lgwl	2	\$3.99	\$8
Sub-total	10		\$40
Total Annual Costs			\$962

^a Numbers reflect 25% of MMUs (from Table IV-27)

^b Post Plan Costs Per MMU (same as in Table IV-27).

Proposed § 70.205(d)
Costs to Reschedule Verification Sampling

Paragraph (d) states that the appropriate MSHA District Manager must be notified by the mine operator if the operator is not going to be able to meet the scheduled date for MSHA to conduct plan verification sampling. For each employment category, MSHA estimates that 10 percent of the MMUs scheduled for verification would be unable to meet the scheduled MSHA verification sampling date and thus would have to reschedule the verification sampling. MSHA estimates that it would take 0.25 hours (15 minutes) for a supervisor, earning \$49.79 per hour, to make a telephone call to the District Manager to reschedule verification sampling.

Table IV-31 shows the first year costs for a mine supervisor to notify MSHA concerning rescheduling verification sampling, where such costs are associated with the first, second, or third round of original verification noted in Table IV-17.

Table IV-32 shows first year costs for a mine supervisor to notify MSHA concerning rescheduling verification sampling for MMUs that need to re-verify ventilation plans in the first year of the PV rule.

Table IV-33 combines all first year costs to show the total adjusted first year and annualized costs for a mine supervisor to notify MSHA concerning rescheduling verification sampling.

Table IV-31: Proposed 70.205(d)

First Year Costs to Reschedule Verification Sampling

Ug. Coal Mine Size	MMUs 1st Round ^a	MMUs 2nd Round ^b	MMUs 3rd Round ^c	Cost to Re- schedule ^d	Re- schedule Costs 1st Try ^e	Re- schedule Costs 2nd Try ^f	Re- schedule Costs 3rd Try ^g	First Year Costs
First Year Costs								
<20 emp.	21.1	5.3	0.4	\$12.45	\$263	\$66	\$5	\$333
>20 emp. ≤500 no lgwl	69.1	17.3	1.2	\$12.45	\$860	\$215	\$15	\$1,090
>20 emp. ≤500 lgwl	4.5	3.0	2.2	\$12.45	\$56	\$37	\$28	\$121
Sub-total	73.6	20.2	3.4		\$916	\$252	\$43	\$1,211
>500 emp. no lgwl	3	0.8	0.1	\$12.45	\$37	\$9	\$1	\$47
>500 emp. lgwl	0.7	0.4	0.3	\$12.45	\$9	\$5	\$4	\$18
Sub-total	3.7	1.2	0.4		\$46	\$15	\$5	\$65
Total First Year Costs					\$1,225	\$332	\$52	\$1,609

^a 10% of MMUs listed as "1st Round" in Table IV-17.

^b 10% of MMUs listed as "Fail 1st Round (need 2nd try)" in Table IV-17.

^c 10% of MMUs listed as "Fail 1st & 2nd Round (need 3rd try)" in Table IV-17.

^d Cost Formula: $(0.25 \times \$49.79)$; where 0.25 hrs. is the time for the supervisor to reschedule verification sampling; and \$49.79 is the supervisor's hourly wage rate.

^e MMUs 1st Round multiplied by cost to reschedule.

^f MMUs 2nd Round multiplied by cost to reschedule.

^g MMUs 3rd Round multiplied by cost to reschedule.

Table IV-32: Proposed 70.205(d)
First Year Costs to Reschedule Verification Sampling
For Those MMUs That Must Re-Verify Their Ventilation Plan

Ug. Coal Mine Size	MMUs 1st Round ^a	Cost to Resch- edule ^b	First Year Costs
First Year Costs			
<20 emp.	1.5	\$12.45	\$19
>20 emp. ≤500 no lgwl	4.9	\$12.45	\$61
>20 emp. ≤500 lgwl	0.6	\$12.45	\$7
Sub-total	5.5		\$68
>500 emp. no lgwl	0.1	\$12.45	\$1
>500 emp. lgwl	0.1	\$12.45	\$1
Sub-total	0.2		\$2
Total First Year Costs			\$90

^a 10% of the MMUs numbers from Table IV-18.

^b Cost Formula: (0.25 x \$49.79); where 0.25 hrs. is the time for the supervisor to reschedule verification sampling; and \$49.79 is the supervisor's hourly wage rate.

Table IV-33: Proposed 70.205(d)

Total First Year and Annualized Costs to Reschedule Verification Sampling

Ug. Coal Mine Size	First Year Costs ^a	Annual Costs ^b	Adjusted First Year Costs ^c	Adjusted First Year Cost Annualized ^d
Adjusted First Year Costs Annualized				
<20 emp.	\$333	\$66	\$267	\$19
>20 emp. ≤500 no lgwl	\$1,090	\$215	\$875	\$61
>20 emp. ≤500 lgwl	\$121	\$14	\$107	\$7
Sub-total	\$1,211	\$229	\$982	\$69
>500 emp. no lgwl	\$47	\$9	\$38	\$3
>500 emp. lgwl	\$18	\$2	\$16	\$1
Sub-total	\$65	\$12	\$54	\$4
Total Annualized costs	\$1,609	\$306	\$1,303	\$91

^a A sum of costs from Table IV-31 and Table IV-32.

^b An amount equivalent to annual costs from Table IV-34.

^c Adjusted first year costs equal total first year costs minus first year of annual costs

^d Adjusted total first year costs annualized equals adjusted first year costs times 0.07, where 0.07 is the annualization factor.

MSHA assumes that 25 percent of all sampled MMUs in each mine size category would need to have their plans verified each year (after the first year). MSHA assumes that 10 percent of these MMUs would need to reschedule verification sampling. Table IV-34 shows the underground coal mine operators' annual costs (including an equivalent amount for the first year as derived in the previous table) for rescheduling verification sampling.

Table IV-34: Proposed 70.205(d)
Total Annual Costs to Reschedule Re-verification Sampling

Ug. Coal Mine Size	MMUs^a	Re- schedule costs^b	Total
<20 emp.	5	12.45	\$66
>20 emp. <500 no lgwl	17	12.45	\$215
>20 emp. <500 lgwl	1	12.45	\$14
Sub-total	18		\$229
>500 emp. no lgwl	0.75	12.45	\$9
>500 emp. lgwl	0.18	12.45	\$2
Sub-total	0.93		\$12
Total Annual Costs			\$306

^a 25% of all MMUs listed as "1st Try" in Table IV-17 are estimated to re-verify their ventilation plans. Of the 25%, about 10% are estimated to reschedule verification sampling.

^b Costs to Reschedule (from Table IV-31).

Proposed § 70.218(a) and § 70.210(a)
Costs to Perform Corrective Actions

As previously noted, during the first year the PV rule is in effect, MSHA would not be able to verify the ventilation plans after the first round of verification sampling for all the MMUs. MSHA would therefore have to conduct additional rounds of verification sampling for some MMUs. MSHA assumes that operators would need to take some form of corrective action before carrying out a second or third round of verification sampling. In addition, even after MMUs have verified ventilation plans, some are expected to need to re-verify such plans before the end of the first year. MSHA assumes that for these MMUs that must re-verify in the first year, operators would first need to take some form of corrective actions.

Earlier when determining the costs of additional SFSS citations, MSHA assumed that the corrective actions would be taken in response to a citation issued by an MSHA inspector sample result. However, in this case, the corrective actions would not be taken in response to a citation, but rather in response to a failure to verify the mine's ventilation plan in accordance with the proposed PV rule.

A variety of corrective actions can be taken before trying to verify a ventilation plan. Some of these are more costly and involve considerable input on the part of the mine operator. In general, corrective actions for verifying a ventilation plan

would concentrate on the following types of engineering controls: isolation, ventilation, water/dust suppression, operating parameters, and dust collection. Within each of these areas, the costs of the corrective actions vary because there is no single corrective action that fits every situation.

Table IV-35 shows examples of corrective actions (along with cost ranges) that could be implemented by a non-longwall mine operator to verify a ventilation plan. Table IV-36 shows examples of corrective actions (along with cost ranges) that could be implemented by a longwall mine operator to verify a ventilation plan.

Table IV-35 Corrective Actions and Costs
Involving Engineering Controls
for Non-longwall MMUs Verifying a Ventilation Plan

Type of Action	Cost Range
Isolation installing a remote control device on a machine	\$18,000 to \$36,000
Ventilation changing air flow installing or repositioning curtains	\$50 to \$3,000
Water/Dust Suppression adjusting the number and/or location of water sprays adjusting type, flow, or pressure of a water spray applying wetting agents wetting down roadways	\$50 to \$5,000
Dust Collection installing a scrubber on a machine	\$15,000 to \$35,000
Dust Collection changing scrubber screen size on a machine repairing or replace dust collector on roof bolter	\$300 to \$900

Table IV-36 Corrective Actions and Costs
Involving Engineering Controls
for Longwall MMUs Verifying a Ventilation Plan

Type of Action	Cost Range
Isolation putting passive barriers on a machine enclosing the headgate gate on a longwall panel	\$500 to \$1,000
Ventilation changing air flow adjusting belt air installing or repositioning curtains installing gob curtains in mines with longwalls installing a shearer-clearer system for a longwall	\$300 to \$10,000
Water/ Dust Suppression adjusting the number and/or location of water sprays adjusting type, flow, or pressure of a water spray applying wetting agents wetting down roadways washing down shields in mines with longwalls	\$300 \$20,000
Operating Parameters changing the cutting speed of longwall machine	\$7,500 to \$10,000
Dust Collection installing a headgate dust collector on a longwall	\$4,000 \$10,000

Operators may engage in more than one type of corrective action. MSHA assumes that the following corrective actions would be taken in response to a non-longwall MMU involved in either a second or third round of verification sampling. One percent would take corrective actions that involve isolation, costing between \$18,000 and \$36,000 (for an average of \$27,000); 80 percent would take corrective actions that involve ventilation, costing between \$50 and \$3,000 to install (for an average of \$1,525); 100 percent would take corrective actions that involve water/dust suppression, costing between \$50 and \$5,000 to install (for an average of \$2,525); 1 percent would take corrective actions that involve dust collection (that is, to install a scrubber on a machine), costing between \$15,000 and \$35,000; and 50 percent would take corrective actions that involve dust collection (that is, changing the size of the scrubber screen size on a machine, or repairing or replacing dust collectors on roof bolters), costing between \$300 and \$900 to install (for an average of \$600). On average, the cost to install corrective actions for a non-longwall MMU is estimated to be $\$4,565 = (0.01 \times \$27,000) + (0.8 \times \$1,525) + (1 \times \$2,525) + (0.01 \times \$25,000) + (0.5 \times \$600)$. These corrective actions would also generate an associated stream of annual operating, maintenance, and replacement (OM&R) costs. MSHA estimates that these OM&R costs each year would be equal to approximately 25

percent of the original installation costs.³⁴

MSHA assumes the following corrective actions would be taken for longwall MMUs involved in a second or third round of verification sampling: 15 percent would take corrective actions that involve isolation, costing between \$300 and \$1,000 to install (for an average of \$650); 100 percent would take corrective actions that involve ventilation, costing between \$300 and \$10,000 to install (for an average of \$5,150); 100 percent would take corrective actions that involve water/dust suppression, costing between \$300 and \$20,000 to install (for an average of \$10,150); 10 percent would take corrective actions that involve operating parameters, costing between \$7,500 and \$12,500 to install (for an average of \$10,000); and 10 percent would take corrective actions that involve dust collection, costing between \$4,000 and \$10,000 to install (for an average of \$7,000). On average, the cost to install corrective actions for a longwall MMU is estimated to be $\$17,098 = (0.15 \times \$650) + (1 \times \$5,150) + (1 \times \$10,150) + (0.10 \times \$10,000) + (0.10 \times \$7,000)$. These corrective actions would also generate an associated stream of annual OM&R costs, where these costs each year would be equal

³⁴ The discounted present value of the annual OM&R costs is equal to:

$$S = \sum_{i=1}^{\infty} (0.25 \times C) / (1 + 0.07)^i$$

where C is the cost of installing the corrective action, 0.07 is the discount rate, and i represents the nth year after the proposed rule takes effect. This equation for S can be simplified to equal $(0.25 \times C / 0.07)$.

to approximately 25 percent of the original installation costs.

MSHA requests comments on the above discussion concerning the estimated corrective actions, their associated cost ranges, and the applicability of such corrective actions to verifying ventilation plans under the proposed PV rule.

Table IV-37 shows operators' first year costs for taking corrective actions, where such costs are associated with the first, second, and third rounds of original verification noted in Table IV-17.

Table IV-38 shows first year costs for taking corrective actions for MMUs that need to re-verify ventilation plans in the first year of the PV rule. Before these MMUs re-verify, MSHA assumes, for costing purposes in this analysis, they would need to take corrective actions that are similar in type to the scenarios noted above for first year cost corrective actions. However, in many cases, the corrective actions needed would merely augment the initial corrective actions. MSHA assumes that the costs of these corrective actions per MMU that would re-verify would be equal to approximately 30 percent of the cost of the corrective actions taken the first year by those MMUs that initially verify their ventilation plans. The 30 percent estimate would apply to both the costs of installing the later corrective actions and the associated stream of OM&R costs.

Table IV-39 combines all first year costs to show the total

adjusted first year and annualized costs for taking corrective actions.

Table IV-37: Proposed 70.210(a) and 70.218(a)
First Year Costs to Take Corrective Actions Related to Verification Sampling *

Ug. Coal Mine Size	MMUs ^a	MMUs ^b	Corrective Action Costs per MMU ^c	Corrective Action Costs Before 2nd Round at Verification Sampling	Corrective Action Costs Before 3rd Round at Verification Sampling	First Year Costs
First Year Costs						
<20 emp.	53	4	\$20,869	\$1,100,817	\$77,057	\$1,177,874
>20 emp. ≤500 no lgwl	173	12	\$20,869	\$3,605,046	\$252,353	\$3,857,399
>20 emp. ≤500 lgwl	30	22	\$78,162	\$2,321,420	\$1,741,065	\$4,062,485
Sub-total	202	34		\$5,926,466	\$1,993,418	\$7,919,884
>500 emp. no lgwl	8	1	\$20,869	\$156,514	\$10,956	\$167,470
>500 emp. lgwl	4	3	\$78,162	\$328,282	\$246,211	\$574,493
Sub-total	12	4		\$484,796	\$257,167	\$741,963
Total First Year Costs				\$7,512,079	\$2,327,643	\$9,839,721

* Note that these "first year" costs include the discounted present value of a stream of annual costs associated with the first year installation costs.

^a MMUs taking corrective actions before their 2nd Round at verification sampling (from Table IV-17).

^b MMUs taking corrective actions before their 3rd Round at verification sampling (from Table IV-17).

^c For non-longwall MMUs \$20,869 = first year cost of Y, where $Y = P + ((0.25 \times P)/0.07)$. P = average cost of first year corrective action \$4,565 = $(0.01 \times \$27,000) + (0.8 \times \$1,525) + (1 \times \$2525) + (0.01 \times \$25,000) + (0.5 \times \$600)$; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs. For longwall MMUs \$78,162 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action \$17,098 = $(0.15 \times \$650) + (1 \times \$5,150) + (1 \times \$10,150) + (0.10 \times \$10,000) + (0.10 \times \$7,000)$; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

**Table IV-38: Proposed 70.210(a) and 70.218(a)
First Year Costs to Take Corrective Actions Related to Verification Sampling
For Those MMUs That Must Re-Verify Their Ventilation Plan**

Ug. Coal Mine Size	MMUs ^a	Corrective Action Costs per MMU ^b	First Year Costs
First Year Costs			
<20 emp.	15	\$6,261	\$93,909
≥20 emp. ≤500 no lgwl	49	\$6,261	\$306,768
≥20 emp. ≤500 lgwl	6	\$23,449	\$140,692
Sub-total	55		\$447,460
>500 emp. no lgwl	1	\$6,261	\$6,261
>500 emp. lgwl	1	\$23,449	\$23,449
Sub-total	2		\$29,709
Total First Year Costs			\$571,078

^a Number of MMUs from Table IV-18.

^b For non-longwall mines \$6,261 =
 $(0.30 \times \$4,565) + ((0.25 \times 0.30 \times \$4,565) / 0.07)$
For longwall mines \$23,449 =
 $(0.30 \times \$17,098) + ((0.25 \times 0.30 \times \$17,098) / 0.07)$

Table IV-39: Proposed 70.210(a) and 70.218(a)

Total First Year and Annualized Costs to Take Corrective Actions Related to Verification Sampling

Ug. Coal Mine Size	First Year Costs ^a	Annual Costs ^b	Adjusted First Year Costs ^c	Adjusted First Year Cost Annualized ^d
Adjusted First Year Costs Annualized				
<20 emp.	\$1,271,783	\$330,245	\$941,538	\$65,908
≥20 emp. ≤500 no lgwl	\$4,164,167	\$1,081,514	\$3,082,653	\$215,786
≥20 emp. ≤500 lgwl	\$4,203,177	\$263,798	\$3,939,379	\$275,757
Sub-total	\$8,367,344	\$1,345,311	\$7,022,032	\$491,542
>500 emp. no lgwl	\$173,731	\$46,954	\$126,777	\$8,874
>500 emp. lgwl	\$597,941	\$41,035	\$556,906	\$38,983
Sub-total	\$771,672	\$87,989	\$683,683	\$47,858
Total Annualized costs	\$10,410,799	\$1,763,546	\$8,647,253	\$605,308

^a A sum of costs from Table IV-37 and Table IV-38.

^b An amount equivalent to annual costs from Table IV-40.

^c Adjusted first year costs equal total first year costs minus first year of annual costs

^d Adjusted total first year costs annualized equals adjusted first year costs times 0.07 where 0.07 is the annualization factor.

In addition to the above first year costs, MSHA estimates that each year 25 percent, on average, of all MMUs in each mine size category would need to verify their ventilation plans and conduct verification sampling (after the first year). For costing purposes in this analysis, MSHA assumes operators, before conducting verification sampling, would need to take corrective actions that are similar in type to the scenarios noted above for first year cost corrective actions. However, in many cases, the corrective actions needed would merely augment the initial corrective actions. MSHA assumes that the costs of these corrective actions per MMU in later years would be equal to approximately 30 percent of the cost of the corrective actions taken the first year by those MMUs that initially verified ventilation plans. The 30 percent estimate would apply to both the costs of installing the later corrective actions and the associated stream of OM&R costs.

Table IV-40 shows the underground coal mine operators' annual costs (including an equivalent amount for the first year as derived in the previous table) for corrective actions taken by 25 percent of all MMUs in each underground coal mine size category.

Table IV-40: Proposed 70.210(a) and 70.218(a)
Total Annual Costs for Corrective Actions Related to Verification Sampling

Ug. Coal Mine Size	MMUs ^a	Corrective Action Costs per MMU ^b	Annual Corrective Action Costs
<20 emp.	53	\$6,261	\$330,245
>20 emp. <500 no lgwl	173	\$6,261	\$1,081,514
>20 emp. <500 lgwl	11	\$23,449	\$263,798
Sub-total	184		\$1,345,311
>500 emp. no lgwl	8	\$6,261	\$46,954
>500 emp. lgwl	2	\$23,449	\$41,035
Sub-total	9		\$87,989
Total Annual Costs			\$1,763,546

^a Nos. reflect 25% of MMUs (from Table IV-37).

^b For non-longwall mines \$6,261 =
 $(0.30 \times \$4,565) + ((0.25 \times 0.30 \times \$4,565)/0.07)$
For longwall mines \$23,449 =
 $(0.30 \times \$17,098) + ((0.25 \times 0.30 \times \$17,098)/0.07)$

MSHA's Estimate of the Number of Shifts Required for Verification Sampling

As noted earlier, verification sampling is not a cost to mine operators since MSHA is performing the sampling. However, the expected frequency of MSHA's verification sampling relates directly to certain operator costs in the PV rule. In the same manner, the number of shifts to be sampled during each round of original verification sampling is discussed below because it is related to operator costs in the PV rule associated with the miners' right to observe verification sampling. On each shift that an MSHA inspector performs verification sampling, a miners' representative has the right to observe such samples without loss of pay.

First Year PV Rule is in Effect

During the first round of verification sampling, MSHA assumes that not all mines will be able to get valid verification samples after sampling their first shift. In the first round of verification sampling, some MMUs would need to be sampled more than one full shift in order to get a shift in which all verification sample results taken on that shift are valid.

For all MMUs (both non-longwall and longwall MMUs) involved in the first round of original verification sampling, MSHA assumes that it would be able to obtain valid verification samples for an MMU based on sampling anywhere from 1 to 5 shifts.

For the first round of verification sampling, the average number of shifts per MMU (regardless of mine size) needed to be sampled in order to get valid verification samples is 1.49 shifts = (67% MMUs x 1 shift) + (22% MMUs x 2 shifts) + (7% MMUs x 3 shifts) + (3% MMUs x 4 shifts) + (1% MMUs x 5 shifts).³⁵

As noted earlier, MSHA further expects that, even after all MMUs get valid verification samples after their first round of verification sampling, some of the sample results from the first round of verification sampling would not show compliance with the critical values in the proposed PV rule. Therefore, for these MMUs, a second round of verification sampling would be needed in order to obtain valid verification samples whose results are at or below the critical values in the proposed PV rule. MSHA assumes that for MMUs sampled in a second round of verification sampling, one shift would be sufficient to get valid verification samples. Still, some of the MMUs involved in a second round of verification sampling will have valid verification samples that would not meet the critical values in the proposed PV rule. These MMUs would need a third round of verification sampling.

For MMUs sampled in a third round of verification sampling, one shift would be sufficient to get valid verification samples. In addition, MSHA assumes that all of these valid samples taken

³⁵ The percentages of MMUs that can obtain a valid verification sample between 1 to 5 shifts were obtained from technical staff of MSHA's Coal Mine and Health Division who have held discussions with MSHA's field staff. These percentages are based on the assumption that two thirds of the MMUs in any shift during the first round will obtain a valid verification sample.

during the third round of verification sampling would meet the critical values in the proposed rule.

The following example provides further explanation of MSHA's verification sampling:

Suppose that an MMU, during the first round of verification sampling, has had 4 full shifts sampled (the first 3 full shifts did not produce valid verification samples, but the 4th full shift did). MSHA then analyzed the valid verification sample results obtained from the 4th full shift and found that they were not at or below the critical values noted in the proposed PV rule. Therefore, a second round of verification sampling would be needed. When a second round of verification sampling is conducted for the MMU, MSHA assumes that valid verification samples would be achieved on the first full shift sampled. If the mine's valid verification sample results from the second round of verification sampling failed to be at or below the critical values noted in the proposed PV rule, then the MMU would be involved in a third round of verification sampling. In the third round of verification sampling, MSHA assumes that the MMU would be able to get valid verification samples after the first full shift sampled, and that the sample results would be at or below the critical values in the proposed PV rule.

First Year Re-Verification Under PV Rule

MSHA's estimate of the number of MMUs that need to re-verify ventilation plans in the first year that the PV rule is in effect are provided in Table IV-18. MSHA assumes that for this re-verification process it would sample MMUs in the same manner as it did during the first round of original verification sampling. Therefore, on average, MMUs would need 1.49 shifts sampled in order to obtain valid verification samples that are at or below the critical values in the PV rule.

Subsequent Years PV Rule is in Effect

After the first year, re-verification of the ventilation plan could be required if an MSHA sample result showed non-compliance or if the mining conditions have significantly changed. On average, MSHA assumes that in subsequent years, after the first year of the rule, about 25 percent of MMUs in each category presented in Table IV-17 listed by the heading "1st Round" would need to re-verify the ventilation plans. This 25 percent annual rate was supplied by technical staff in MSHA's Coal Mine Health Division. In addition, MSHA again assumes that for this annual re-verification process MMUs would need, on average, 1.49 shifts sampled in order to obtain valid verification samples that meet the critical values in the PV rule.

Cost of Miners to Participate in Verification Sampling

In accordance with § 103(f) of the Mine Act and the recommendations of the Advisory Committee, miners and their representatives would be provided the same walk-around rights during plan verification sampling as they are provided during any other physical inspection made pursuant to the provisions of § 103(a) by an authorized representative of MSHA.

MSHA believes that under the guidance of the Interpretive Bulletin 43 FR 17546 (April 25, 1978) these rights arise when:

1) an "inspection" is made for the purposes set forth in § 103(a), and (2) the inspector is physically present at the mine to observe or monitor safety and health conditions as part of direct safety and health enforcement activity.

The process of plan verification sampling is necessary in order to obtain information related to approval of the mine's ventilation plan and to determine whether coal mine dust will be adequately controlled to protect miners' health. Consequently, miners and their representative would have the right to accompany the inspector with no loss of pay for the time during which the representative exercises this right. However, this right is limited by § 103(f) to only one such representative of miners.

MSHA does not expect that all MMUs would have a miner representative observing verification sampling when it occurs. MSHA assumes that all unionized mines would have a miners' representative observe verification sampling. However, MSHA anticipates that only a portion of mines not unionized would have a miners' representative observe verification sampling. After consulting with MSHA's field staff, the Agency's Coal Mine Health Division estimated the number of MMUs that would involve a miner representative observing verification sampling. The results are discussed below. Note that if the estimated number of non-unionized mines observing verification sampling was a fraction less than 1, the number was rounded up to one. MSHA requests

comments on the level of miner participation in observing verification sampling that MSHA has estimated below.

First Year PV Rule is in Effect

The percentage estimates that appear below concerning the amount of miner participation in observing verification sampling were supplied by MSHA's Coal Mine Health Division.

Of the 211 MMUs in mines employing fewer than 20 workers, 10 percent (21 MMUs) are estimated to be in union mines. As previously noted, MSHA assumes that all of these union mines would have a miner representative observing verification sampling. Of the remaining 190 MMUs in non-unionized mines, MSHA estimates that 3 percent (6 MMUs) would have a miner observing verification sampling. Therefore, 27 MMUs (21 + 6) in mines employing fewer than 20 workers, would have miners observing verification sampling.

Of the 691 MMUs in non-longwall mines employing between 20 and 500 workers, 27 percent (187 MMUs) are estimated to be in union mines. Of the remaining 504 MMUs in non-unionized mines, MSHA estimates that 5 percent (25 MMUs) will have a miner observing verification sampling. Therefore, 212 MMUs (187 + 25) in non-longwall mines employing between 20 and 500 workers would have miners observing verification sampling.

Of the 45 MMUs in longwall mines employing between 20 and

500 workers, 57 percent (26 MMUs) are estimated to be in union mines. Of the remaining 19 MMUs in non-unionized mines, MSHA estimates that 5 percent (1 MMU) would have a miner observing verification sampling. Therefore, 27 MMUs (26 + 1) in longwall mines employing between 20 and 500 workers would have miners observing verification sampling.

Of the 30 MMUs in non-longwall mines employing more than 500 workers, 82 percent (25 MMUs) are estimated to be in union mines. Of the remaining 5 MMUs in non-unionized mines, MSHA estimates that 5 percent (1 MMU) would have a miner observing verification sampling. Therefore, 26 MMUs (25 + 1) in non-longwall mines employing more than 500 workers would have miners observing verification sampling.

Of the 7 MMUs in longwall mines employing between 20 and 500 workers, 75 percent (5 MMUs) are estimated to be in union mines. Of the remaining 2 MMUs in non-unionized mines, MSHA estimates that none would have a miner observing verification sampling. Therefore, 5 MMUs in longwall mines employing more than 500 workers would have miners observing verification sampling.

First Year Re-Verification Under the PV Rule

Of the 15 MMUs in mines employing fewer than 20 workers, 10 percent (2 MMUs) are estimated to be in union mines. Of the remaining 13 MMUs in non-unionized mines, MSHA estimates

that 3 percent (1 MMU) would have a miner observing verification sampling. Therefore, 3 MMUs (2 + 1) in mines employing fewer than 20 workers would have miners observing verification sampling.

Of the 49 MMUs in non-longwall mines employing between 20 and 500 workers, 27 percent (about 13 MMUs) are estimated to be in union mines. Of the remaining 36 MMUs in non-unionized mines, MSHA estimates that 5 percent (2 MMUs) would have a miner observing verification sampling. Therefore, 15 MMUs (13 + 2) in non-longwall mines employing between 20 and 500 workers would have miners observing verification sampling.

Of the 6 MMUs in longwall mines employing between 20 and 500 workers, 57 percent (3 MMUs) are estimated to be in union mines. Of the remaining 3 MMUs in non-unionized mines, MSHA estimates that 5 percent (1 MMU) would have a miner observing verification sampling. Therefore, 4 MMUs (3 + 1) in longwall mines employing between 20 and 500 workers would have miners observing verification sampling.

MSHA assumes that the 1 MMU in a non-longwall mine employing more than 500 workers would have miners observing verification sampling.

MSHA also assumes that the 1 MMU in a longwall mine employing more than 500 workers would have miners observing verification sampling.

Subsequent Year PV Rule is in Effect

Each year after the first year, approximately 25 percent of the ventilation plans would have to be re-verified. For each verification, the MMUs would have miner participation in observing verification sampling.

Table IV-41 below summarizes the MMUs in each mine size category and by non-longwall and longwall that would have miner participation in observing verification sampling, during the first year and every year thereafter.

Table IV-41
MMUs Having Miner Participation
in Observing Verification Sampling

Mine Size	In 1 st Year		Annually, After 1 st Year
	MMUs Having Miner Participation in Observing Original Verification Sampling	MMUs Having Miner Participation in Observing Re- verification Sampling	MMUs Having Miner Participation in Observing Verification Sampling
<20 emp.	27	3	6
≥20 emp. ≤500 no lgwl	212	15	53
≥20 emp. ≤500 lgwl	27	4	7
Sub-Total	239	20	60
>500 emp. no lgwl	26	1	6
>500 emp. lgwl	5	1	1
Sub-Total	31	2	7
Total MMUs	297	25	73

MSHA assumes that miners would choose to participate during their entire shift. Although many mines operate 8 hour shifts, there are some mines with longer shifts. Taking into account the number of underground coal mines and the different lengths of shifts, MSHA estimates that the length of an average shift is 8.5 hours. Therefore, the Agency assumes that, each time a single, full-shift verification sample is taken, the miner or miners' representative would take about 8.5 hours to participate in verification sampling.

Table IV-42 shows the first year costs for miners or miners' representatives to participate in original verification sampling, where such costs are associated with the first, second, and third round of original verification noted in Table IV-17.

Table IV-43 shows first year costs for miners or miners' representatives to participate in re-verification sampling conducted during the first year.

Table IV-44 combines all first year costs to show the total first year adjusted and annualized costs for miners or miners' representatives to participate in verification sampling

Table IV-42:
First Year Costs for Miners or their Representative to Participate in Verification Sampling

Ug. Coal Mine Size	MMUs ^a	Cost to Participate in Sampling ^b	No. of Shifts on 1st Round	No. of Shifts on 2nd Round	No. of Shifts on 3rd Round	Costs to Participate- in 1st Round ^c	Costs to Participate in 2nd Round ^d	Costs to Participate in 3rd Round ^e	First Year Costs
First Year Costs									
<20 emp.	27	\$228.06	1.49	1	1	\$9,175	\$1,539	\$431	\$11,145
>20 emp. ≤500 no lgwl	212	\$228.06	1.49	1	1	\$72,038	\$12,087	\$3,384	\$87,509
>20 emp. ≤500 lgwl	27	\$228.06	1.49	1	1	\$9,175	\$4,064	\$4,618	\$17,857
Sub-total	239					\$81,213	\$16,151	\$8,002	\$105,366
>500 emp. no lgwl	26	\$228.06	1.49	1	1	\$8,835	\$1,482	\$415	\$10,732
>500 emp. lgwl	5	\$228.06	1.49	1	1	\$1,699	\$684	\$855	\$3,238
Sub-total	31					\$10,534	\$2,167	\$1,270	\$13,971
Total First Year Costs						\$100,921	\$19,857	\$9,704	\$130,482

^a MMU numbers from Table IV-41.

^b \$228.06 per shift = (8.5 hr. x \$26.83 wage).

^c MMUs x Cost to Participate in Sampling x No. of Shifts on 1st Round.

^d For all non-longwall MMUs =

(no. of ug. MMUs x 0.25 failure rate) x cost to observe sampling x no. of shifts on 2nd Round.

For longwall MMUs with ≥20 emp. ≤500 workers =

(no. of ug. MMUs x 0.66 failure rate) x cost to observe sampling x no. of shifts on 2nd Round.

For longwall MMUs with >500 workers =

(no. of ug. MMUs x 0.60 failure rate) x cost to observe sampling x no. of shifts on 2nd Round.

^e For all non-longwall MMUs =

(no. of ug. MMUs x 0.07 failure rate) x cost to observe sampling x no. of shifts on 3rd Round.

For all longwall MMUs =

(no. of ug. MMUs x 0.75 failure rate) x cost to observe sampling x no. of shifts on 3rd Round.

Table IV-43:

First Year Costs for Miners or their Representative to Participate in Veri
For Those MMUs That Must Re-Verify Their Ventilation Plan

Ug. Coal Mine Size	MMUs ^a	Costs to Participate in Sampling ^b	No. of Shifts on 1st Round	First Year Costs to Parti- cipate ^c
First Year Costs				
<20 emp.	3	\$228.06	1.49	\$1,019
>20 emp. ≤500 no lgwl	15	\$228.06	1.49	\$5,097
>20 emp. ≤500 lgwl	4	\$228.06	1.49	\$1,359
Sub-total	19			\$6,456
>500 emp. no lgwl	1	\$228.06	1.49	\$340
>500 emp. lgwl	1	\$228.06	1.49	\$340
Sub-total	2			\$680
Total First Year Costs				\$8,155

^a MMU numbers from Table IV-41.

^b \$228.06 per shift = (8.5 hr. x \$26.83 wage).

^c Formula = MMU x Cost to Participate in Sampling
x No. of Shifts on 1st Round

Table IV-44:

**Total First Year and Annualized Costs for Miners or their Representative
to Participate in Verification Sampling**

Ug. Coal Mine Size	Total First Year Costs ^a	Annual Costs ^b	Adjusted First Year Costs ^c	Adjusted First Year Costs Annualized ^d
Adjusted First Year Costs Annualized				
<20 emp.	\$12,164	\$2,039	\$10,126	\$709
≥20 emp. ≤500 no lgwl	\$92,606	\$18,010	\$74,597	\$5,222
≥20 emp. ≤500 lgwl	\$19,216	\$2,379	\$16,837	\$1,179
Sub-total	\$111,822	\$20,388	\$91,434	\$6,400
>500 emp. no lgwl	\$11,072	\$2,039	\$9,033	\$632
>500 emp. lgwl	\$3,578	\$340	\$3,238	\$227
Sub-total	\$14,650	\$2,379	\$12,272	\$859
Total Annualized costs	\$138,637	\$24,806	\$113,831	\$7,968

^a A sum of costs from Table IV-42 and Table IV-43.

^b An amount equivalent to annual costs from Table IV-45.

^c Adjusted first year costs equal total first year costs minus first year of annual costs.

^d Adjusted total first year costs annualized equals adjusted first year costs times 0.07,
where 0.07 is the annualization factor.

On average, each year, 25 percent of all MMUs in each mine size category would need to verify their plans and conduct verification sampling (after the first year). For these MMUs the estimated level of participation in verification sampling by miners is shown in Table IV-41.

Table IV-45 shows the annual costs (including an equivalent amount for the first year as derived in the previous table) for miners or miners' representatives to participate in verification sampling.

Table IV-45:
Total Annual Costs for Miners or Their Representatives
to Participate in Verification Sampling

Ug. Coal Mine Size	Ug. MMUs^a	Cost to Partic- pate in Sampling^b	No. of Shifts Observed^c	Annual Costs to Observe Sampling
<20 emp.	6	\$228.06	1.49	\$2,039
>20 emp. <500 no lgwl	53	\$228.06	1.49	\$18,010
>20 emp. <500 lgwl	7	\$228.06	1.49	\$2,379
Sub-total	60			\$20,388
>500 emp. no lgwl	6	\$228.06	1.49	\$2,039
>500 emp. lgwl	1	\$228.06	1.49	\$340
Sub-total	7			\$2,379
Total Annual Costs				\$24,806

^a Number of MMU (from Table IV-41).

^b Cost to Participate in Sampling from Table IV-42.

^c No. of Shifts Observed from Table IV-42.

Proposed § 75.370(h)
Record of Material Produced

Proposed § 75.370(h) requires that mine operators keep records of the amount of material produced by each MMU for six months. This record must be made available for inspection by authorized representatives of the Secretary and the representative of the miners. Since operators already maintain a record of the amount of material produced on each shift, this provision would not impose any costs on operators.

MSHA's Estimate of the Number of Samples Taken During Verification Sampling

As noted earlier, it was necessary to understand how often verification sampling is expected to occur because it is related directly to certain operators costs in the plan verification rule. One of these costs is the operator's cost of posting sample results. After MSHA takes verification samples and analyzes them, the Agency sends the sample results to the operator who is required to post them. Therefore, the number of sample results to post is equal to the number of samples taken. Below is a discussion of the average number of verification samples that MSHA estimates would be taken during verification sampling.

First Year PV Rule is in Effect

For Non-longwall MMUs

For a non-longwall MMU involved in the first round of verification sampling, MSHA assumes that: (1) three persons would need to be sampled on each full shift (two roof bolters and one designated occupation); and (2) only engineering controls would be used. In addition, MSHA would be able to obtain valid verification samples for each MMU based on sampling anywhere from 1 to 5 shifts.³⁶ For the first round of verification sampling, the average number of verification samples per non-longwall MMU (regardless of mine size) needed to be taken in order to get valid verification samples is 4.47 samples:

$$\begin{aligned} 4.47 = & (67\% \text{ non-lgwl MMUs } \times 1 \text{ shift } \times 3 \text{ workers sampled}) + \\ & (22\% \text{ non-lgwl MMUs } \times 2 \text{ shifts } \times 3 \text{ workers sampled}) + \\ & (7\% \text{ non-lgwl MMUs } \times 3 \text{ shifts } \times 3 \text{ workers sampled}) + \\ & (3\% \text{ non-lgwl MMUs } \times 4 \text{ shifts } \times 3 \text{ workers sampled}) + \\ & (1\% \text{ non-lgwl MMUs } \times 5 \text{ shifts } \times 3 \text{ workers sampled}). \end{aligned}$$

During the second and third round of verification sampling on a non-longwall MMU, MSHA still assumes that: (1) three persons would need to be sampled on each full shift; and (2) only engineering controls would be used. However, as noted earlier, for the second and third round of verification sampling MSHA assumes that it would be able to obtain valid verification

³⁶ The percentage of MMUs that can obtain a valid verification sample between 1 to 5 shifts were obtained from technical staff in MSHA's Coal Mine and Health Division who have had discussions with MSHA's field staff.

samples after sampling the first full shift. Therefore, for the second and third round of verification sampling, the average number of verification samples per non-longwall MMU (regardless of mine size) estimated to be taken in order to get valid verification samples is 3 samples:

$$3 = (1 \text{ non-lgwl shift} \times 3 \text{ workers sampled}).$$

For Longwall MMUs

For operators with a longwall MMU involved in the first round of verification sampling, MSHA assumes that: (1) four persons would be sampled on each full shift (three jack setters and one designated occupation, which is usually the headgate longwall operator); and (2) engineering controls would be used when conducting verification sampling. Again, MSHA would be able to obtain valid verification samples for each MMU based on sampling anywhere from 1 to 5 shifts (the percentages are the same as those noted above for non-longwall mines). Therefore, during the first round of verification sampling, the average number of verification samples per longwall MMU (regardless of mine size) needed to be taken in order to get valid verification samples is 5.96 samples:

$$5.96 = (67\% \text{ lgwl MMUs} \times 1 \text{ shift} \times 4 \text{ workers sampled}) + \\ (22\% \text{ lgwl MMUs} \times 2 \text{ shifts} \times 4 \text{ workers sampled}) +$$

(7% lgwl MMUs x 3 shifts x 4 workers sampled) +
(3% lgwl MMUs x 4 shifts x 4 workers sampled) +
(1% lgwl MMUs x 5 shifts x 4 workers sampled).

During the second round of verification sampling for a longwall operation, MSHA still assumes that: (1) four persons would need to be sampled on each full shift; and (2) only engineering controls would be used. However, as noted earlier, MSHA assumes that when it conducts verification sampling after the first round, it would be able to obtain valid verification samples after sampling the first full shift. Therefore, for the second round of verification sampling, the average number of verification samples per longwall MMU (regardless of mine size) estimated to be taken in order to get valid verification samples is 4 samples:

4 = (1 lgwl shift x 4 workers sampled).

For longwall MMUs involved in a third round of verification sampling, MSHA assumes that: (1) miners on these MMUs would either need to use administrative controls or PAPRs in order to get valid verification samples; and (2) when such controls are used, then five persons (instead of 4) would be sampled on each full shift (three jack setters, the headgate longwall operator, and the tailgate longwall operator). Further, as noted earlier, MSHA assumes that when conducting verification sampling after the

first round, it would be able to obtain valid verification samples after sampling the first full shift. Therefore, for the third round of verification sampling, the average number of verification samples per longwall MMU (regardless of mine size) estimated to be taken in order to get valid verification samples is 5 samples:

$$5 = (1 \text{ non-lgwl shift} \times 5 \text{ workers sampled}).$$

First Year Re-Verification Under PV Rule

MSHA's estimates of the number of MMUs that need to have ventilation plans re-verified in the first year that the PV rule is in effect are provided in Table IV-18. MSHA assumes that, for this re-verification process, the number of samples taken, on average, for each MMU would be the same number of samples taken during the first round of original verification sampling. Therefore, the average number of verification samples needed to be taken is 4.47 samples per non-longwall MMU and 5.96 per longwall MMU. These are the number of samples needed in order to obtain valid verification sample results that are at or below the critical values of the PV rule. The number of samples is based on an average of 1.49 shifts per MMU, and 3 miners sampled per non-longwall MMU, and 4 miners sampled per longwall MMU.

Subsequent Years PV Rule is in Effect

After the first year, re-verification of the ventilation plan could be required if an MSHA sample result showed non-compliance or if the mining conditions have significantly changed. On average, MSHA assumes that in subsequent years, after the first year of the rule, about 25 percent of the MMUs in each category presented in Table IV-17 listed by the heading "1st Round" would need to re-verify the ventilation plans. In addition, MSHA again assumes that for this annual re-verification process MMUs would need, on average, 4.47 samples per non-longwall MMU and 5.96 per longwall MMU. These are the number of samples needed in order to obtain valid verification sample results that are at or below the critical values of the PV rule. The number of samples is based on an average of 1.49 shifts per MMU, and 3 miners sampled per non-longwall MMU, and 4 miners sampled per longwall MMU.

Table IV-46 presents the number of samples that would need to be taken by non-longwall and longwall MMUs in order to verify ventilation plans in the first year the PV rule is in effect, and also for every year thereafter.

Table IV-46:
Number of Verification Samples That Need
to be Taken by MMU Type

MMU Type	1 st year of Rule				After the 1 st Year
	Original Verification Sampling			1 st Year Re- Verification	Annual Re- Verification
	Avg. # of Samples Taken on 1 st Round of Verif. Sampling (per MMU)	Avg. # of Samples Taken on 2 nd Round of Verif. Sampling (per MMU)	Avg. # of Samples Taken on 3 rd Round of Verif. Sampling (per MMU)	Avg. # of Samples Taken for Re- verification	Avg. # of Samples Taken for Re- verification
Non lgwls	4.47	3	3	4.47	4.47
Lgwls	5.96	4	5	5.96	5.96

Proposed § 70.220(a)
Cost to Post Verification Sample Results

After MSHA analyses the verification samples it will send them to the mine operator. The mine operator must post the verification sample results upon receipt for 31 days. The posted verification sample results may be removed after the ventilation plan has been approved by the District Manager. All underground mines are affected by this provision. The number of sample results to post corresponds to the number of verification samples taken that were estimated above.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and post the results. Photocopying costs per page are estimated to be \$0.15.

Table IV-47 shows first year costs for posting verification sample results where such costs are associated with the first, second, and third rounds of verification noted in Table IV-17.

Table IV-48 shows first year costs for posting verification sample results related to MMUs that would re-verify ventilation plans in the first year of the PV rule.

Table IV-49 combines all first year costs to show total adjusted first year and annualized costs for posting verification sample results.

Table IV-47: Proposed 70.202(a)

First Year Costs to Post Verification Sample Results

Ug. Coal Mine Size	MMUs	Cost to Post Sample Result ^a	No. of Results to Post 1st Round ^b	No. of Results to Post 2nd Round ^b	No. of Results to Post 3rd Round ^b	Cost to Post Results 1st Round ^c	Cost to Post Results 2nd Round ^d	Cost to Post Results 3rd Round ^e	First Year Costs
First Year Costs									
<20 emp.	211	\$2.01	4.47	3	3	\$1,892	\$317	\$89	\$2,298
≥20 emp. ≤500 no lgwl	691	\$2.01	4.47	3	3	\$6,196	\$1,040	\$291	\$7,527
≥20 emp. ≤500 lgwl	45	\$2.01	5.96	4	5	\$538	\$238	\$339	\$1,115
Sub-total	736					\$6,734	\$1,278	\$630	\$8,642
>500 emp. no lgwl	30	\$2.01	4.47	3	3	\$269	\$45	\$13	\$327
>500 emp. lgwl	7	\$2.01	5.96	4	5	\$84	\$34	\$53	\$170
Sub-total	37					\$353	\$79	\$65	\$497
Total First Year Costs						\$8,979	\$1,674	\$784	\$11,437

^a \$2.01 = (0.1 hrs. x \$18.56 wage)+(1pg. x \$0.15)

^b Number of sample results to post corresponds to number of samples estimated to be taken from Table IV-46.

^c Formula = ug. MMUs x costs to post sample results x no. of sample results on 1st Round.

^d For all non-longwall MMUs =

(no. of ug. MMUs x 0.25 failure rate) x cost to post sample results x no. of sample results on 2nd Round.

For longwall MMUs with ≥20 emp. ≤500 workers =

(no. of ug. MMUs x 0.66 failure rate) x costs to post sample results x no. of sample results on 2nd Round.

For longwall MMUs with >500 workers =

(no. of ug. MMUs x 0.60 failure rate) x cost to post sample results x no. of sample results on 2nd Round.

^e For all non-longwall MMUs =

(no. of ug. MMUs x 0.07 failure rate) x cost to post sample results x no. of sample results on 3rd Round.

For all longwall MMUs =

(no. of ug. MMUs x 0.75 failure rate) x cost to post sample results x no. of sample results on 3rd Round.

Table IV-48: Proposed 70.202(a)
First Year Costs to Post Verification Sample Results
For Those MMUs That Must Re-Verify Their Ventilation Plan

Ug. Coal Mine Size	MMUs ^a	Cost to Post Sample Result ^b	No. of Results to Post ^c	First Year Costs
First Year Costs				
<20 emp.	15	\$2.01	4.47	\$135
>20 emp. ≤500 no lgwl	49	\$2.01	4.47	\$439
>20 emp. ≤500 lgwl	6	\$2.01	5.96	\$72
Sub-total	55			\$511
>500 emp. no lgwl	1	\$2.01	4.47	\$9
>500 emp. lgwl	1	\$2.01	5.96	\$12
Sub-total	2			\$21
Total First Year Costs				\$667

^a Number of MMUs from Table IV-18.

^b \$2.01 = (0.1 hrs. x \$18.56 wage)+(1pg. x \$0.15)

^c Number of sample results to post corresponds to number of samples estimated to be taken from Table IV-46.

^d No. of MMUs x Costs to Post Sample Results
x No. of Results to Post.

Table IV-49: Proposed 70.202(a)

Total First Year and Annualized Costs to Post Verification Sample Results

Ug. Coal Mine Size	First Year Costs ^a	Annual Costs ^b	Adjusted First Year Costs ^c	Adjusted First Year Cost Annualized ^d
Adjusted First Year Costs Annualized				
<20 emp.	\$2,433	\$475	\$1,958	\$137
≥20 emp. ≤500 no lgwl	\$7,966	\$1,551	\$6,415	\$449
≥20 emp. ≤500 lgwl	\$1,187	\$132	\$1,055	\$74
Sub-total	\$9,153	\$1,683	\$7,470	\$523
>500 emp. no lgwl	\$336	\$72	\$264	\$18
>500 emp. lgwl	\$182	\$24	\$158	\$11
Sub-total	\$518	\$96	\$422	\$30
Total Annualized costs	\$12,103	\$2,254	\$9,850	\$689

^a A sum of costs from Table IV-47 and Table IV-48.^b Equivalent amount of annual costs from Table IV-50.^c Adjusted first year costs equal total first year costs minus first year of annual costs.^d Adjusted total first year costs annualized equals adjusted first year costs times 0.07, where 0.07 is the annualization factor.

For each year after the first year, 25 percent of all MMUs in each mine size category would also need to post sample results. The number of sample results to be posted corresponds to the number of verification samples taken, as shown in Table IV-46.

Table IV-50 below shows the annual costs (including an equivalent amount for the first year as derived in the previous table) to operators for posting sample results related to verification sampling.

Table IV-50: Proposed 70.220(a)
Total Annual Costs to Post Verification Sample Results

Ug. Coal Mine Size	MMUs^a	Cost to Post Sample Results^b	No. of Sample Results to Post^c	Total
<20 emp.	53	\$2.01	4.47	\$475
>20 emp. <500 no lgwl	173	\$2.01	4.47	\$1,551
>20 emp. <500 lgwl	11	\$2.01	5.96	\$132
Sub-total	184			\$1,683
>500 emp. no lgwl	8	\$2.01	4.47	\$72
>500 emp. lgwl	2	\$2.01	5.96	\$24
Sub-total	10			\$96
Total Annual Costs				\$2,254

^a Nos. reflect 25% of all MMUs (from Table IV-47).

^b Labor cost for posting (same as in Table IV-47).

Proposed §§ 70.211(b) and 70.212(b)
Cost to Request MSHA Determination That Would Permit the Use
of PAPRs and to Write a Respirator Protection Program

If a longwall operator cannot develop a verified plan with adequate dust control parameters sufficient to assure that dust concentrations are below the applicable standard, the operator can request in writing that MSHA determine whether or not the operator has used all feasible engineering or environmental controls to reduce concentrations of respirable dust to as low as level as is possible. If MSHA makes a determination that the operator has used all available controls, then the operator has the option to use either administrative controls or powered air-purifying respirators (PAPRs), until other feasible engineering or environmental controls become available. The longwall operator must write a revised ventilation plan.

There are no longwalls in mines that employ fewer than 20 workers. There are 45 longwall MMUs in mines employing 20 to 500 workers. Of these 45 longwall MMUs, Table IV-17 shows that 22 of them would need a third round of verification sampling. Of these 22 longwall MMUs, MSHA assumes that for 75 percent or 17 MMUs, miners working on those MMUs would use PAPRs before conducting a third round of verification sampling. Therefore, for 17 longwall MMUs in mines employing 20 to 500 workers the operator would need to write a PAPR program. Table IV-17 shows that there are 3 longwall MMUs in mines employing more than 500 workers that would

need verification sampling for a third time. MSHA assumes that for these 3 longwall MMUs, miners working on those MMUs would use PAPRs before MSHA conducts a third round of verification sampling. Therefore, for the 3 longwall MMUs in mines employing more than 500 workers the operators would need to write a PAPR program.

MSHA estimates that it would take a supervisor, earning \$49.79 per hour, about 4 hours to prepare the material and request in writing that MSHA determine whether or not all feasible engineering or environmental controls have been used. In addition, the supervisor is estimated to spend about 6 hours to write a program to govern the use of PAPRs in accordance with 30 CFR § 72.710. The program would include basic elements for using and maintaining a PAPR program. A clerical worker, earning \$18.56 per hour, is estimated to spend about 0.5 hours typing the above material, which would be sent when submitting the revised ventilation plan.

MSHA expects that the PAPR program would change only infrequently, approximately every 10 years on average. The first year costs for writing a PAPR program were therefore annualized using an annualization factor of 0.142, which reflects an investment period of 10 years and an annual discount rate of 7 percent.

Table IV-51 shows first year and annualized costs for

affected longwall operators (1) to request that MSHA determine whether the operator has used all feasible engineering or environmental controls, and (2) to write a PAPR program.

**Table IV-51: Proposed 70.211(b) and 70.212(b)
Total First Year and Annualized Costs to Request MSHA Determination and
Write a Program for the Use of PAPRs as Required under the Proposed PV Rule**

Ug. Coal Longwall Mine Size	MMUs	Cost (per MMU)^a	First Year Costs	Annualized Costs^b
<20 emp.	0	\$0	\$0	\$0
>20 emp. <500 lgwl	17	\$507.18	\$8,622	\$1,224
>500 emp. lgwl	3	\$507.18	\$1,522	\$216
Total First Year & Annualized Costs			\$10,144	\$1,440

^a \$507.18 = (10 hrs. x \$49.79) + (0.5 hrs. x \$18.56); where 10 hrs. includes 4 hrs. for supervisor to prepare and write requesting MSHA determination that all feasible engineering controls have been used and 6 hours to write PAPR program; \$49.79 is supervisor hourly wage rate; 0.5 hrs. is clerical worker time to type material; \$18.56 is supervisor hourly wage rate.

^b Annualized Costs = First Year Costs x 0.142, where 0.142 is the annualization factor.

Proposed §§ 70.211(b) and 70.216(a)
Cost to Request MSHA Determination That Would Permit the Use
of Administrative Controls and to Write an Administrative
Control Program

There are no longwall operators that employ fewer than 20 miners, and no longwall operators employing more than 500 workers, that are assumed to use administrative controls. As previously noted, 22 of the longwall MMUs in mines employing 20 to 500 workers are assumed to need a third round of verification sampling. For 17 of the 22 MMUs, miners would be able to use PAPRs, and for the remaining 5 MMUs, miners would use administrative controls. Therefore, for 5 longwall MMUs, the mine operator would need to request in writing that MSHA determine whether or not the operator has used all feasible engineering or environmental controls to reduce concentrations of respirable dust to as low a level as is possible. Assuming MSHA would make this determination, the mine operator must write a program that governs the use of administrative controls. This written program must be part of the ventilation plan.

MSHA estimates that it would take a supervisor about 4 hours to prepare the material and request in writing that MSHA determine whether or not all feasible engineering or environmental controls have been used. In addition, the supervisor would need to spend about another 2 hours to write such a program. The program would include basic elements for using and maintaining an administrative program. A clerical

worker, earning \$18.56 per hour, is estimated to spend 0.5 hours typing the above material, which would be sent when submitting the revised ventilation plan.

MSHA expects that the administrative program would change only infrequently, approximately every 10 years on average. The first year costs associated with writing an administrative program were therefore annualized using an annualization factor of 0.142, which reflects an investment period of 10 years and an annual discount rate of 7 percent.

Table IV-52 shows first year and annualized costs for affected longwall operators (1) to request that MSHA determine that the operator has used all feasible engineering or environmental controls, and (2) to write a program governing the use of administrative controls.

**Table IV-52: Proposed 70.211(b) and 70.216(a)
Total First Year and Annualized Costs to Request MSHA Determination and
to Write a Program for the Use of Administration Controls as Required by
the Proposed PV Rule**

Ug. Coal Longwall Mine Size	MMU	Cost (per MMU)^a	First Year Costs	Annualized Costs^b
<20 emp.	0	\$0	\$0	\$0
>20 emp. <500 lgwl	5	\$308.02	\$1,540	\$219
>500 emp. lgwl	0	\$0	\$0	\$0
Total First Year & Annualized Costs			\$1,540	\$219

^a \$308.02 = (6 hrs. x \$49.79) + (0.5 hrs. x \$18.56); where 6 hrs. includes 4 hrs. for supervisor to prepare and write requesting MSHA determination that all feasible engineering controls have been used and 2 hours to write Adm. program; \$49.79 is supervisor hourly wage rate; 0.5 hrs. is clerical worker time to type material; \$18.56 is supervisor hourly wage rate.

^b Annualized Costs = First Year Costs x 0.142, where 0.142 is the annualization factor.

Proposed § 70.216(a)
Costs for Implementing Administrative Controls

In order for longwall operators to implement administrative controls they would have to rotate miners between the different longwall work position. For the 5 longwall MMUs in mines employing 20 to 500 workers that would have miners who use administrative controls, MSHA assumed that 5 work positions per MMU would be rotated. MSHA further assumed that work positions would be: a longwall tailgate operator; a longwall headgate operator; and three jack setters. MSHA estimates that it would take about one minute (0.02 hours) for workers, earning \$26.83 per hour, to rotate positions. Rotation is estimated to occur once after 4 hours on each 8 hour shift. For costing purposes, the Agency assumed that, on average, a longwall MMU operates 6 days per week (or 312 days per year) and runs 3 shifts per day.

Table IV-53 shows the annual costs for operators to rotate workers in longwall MMU that have administrative controls in place.

Table IV-53: Proposed 70.216(a)
Total Annual Costs to Rotate Workers for Longwall Operators
That Use Administrative Controls as Required under the Proposed PV Rule

Ug. Coal Longwall Mine Size	MMUs	Cost to Rotate Workers (per MMU)^a	No. of Rotations (per Yr.)^b	Annual Costs
<20 emp.	0	\$0	0	\$0
>20 emp. <500 lgwl	5	\$2.68	936	\$12,556
>500 emp. lgwl	0	\$0	0	\$0
Total Annual Costs				\$12,556

^a \$2.68 = (0.02 hrs. x \$26.83 x 5): where 0.02 is the number of hours for each miner to rotate; \$26.83 is the miner's hourly wage rate; and 5 is the number of miners that rotate.

^b 936 = (1 x 3 x 312): where 1 is the number of rotations per shift; 3 is the average number of shifts per day; and 312 is the average number of workdays per year.

Proposed § 70.212(b)
Cost to Prepare a PAPR Training Plan for Miners

Section 70.212(b) states that the use of PAPRs should follow the procedures in existing § 72.710. Section 72.710 states that respirators should be used and maintained in accordance with the American National Standards Institute's "Practices for Respiratory Protection ANSI Z88.2-1969." In order to follow the ANSI standard, workers must be trained in the use of PAPRs as part of an overall program.

There are 17 longwall MMUs in mines employing 20 to 500 workers and 3 longwall MMUs in mines employing more than 500 workers that are assumed to have miners that would use PAPRs. MSHA assumes that a mine supervisor would give the PAPR training, and MSHA estimates that it would take about 2 hours to prepare such a training program. This initial training is given once to miners that are affected by this provision and does not have to be repeated, except for new employees. When it is repeated for new employees, the preparation by the supervisor does not have to be repeated. Therefore, the first year costs for the supervisor to prepare for PAPR training has been annualized using an annualization factor of 7 percent.

Table IV-54 shows first year and annualized costs for a supervisor, in affected longwall mines, to prepare for training miners in the use of PAPRs.

Table IV-54: Proposed 70.212(b)
Total First Year and Annualized Costs for Supervisor to Prepare
for Training Miners in the use of PAPRs as Required under the
Proposed PV Rule

Ug. Coal Longwall Mine Size	MMUs	Cost of Superv. to Prepare (per MMU) ^a	First Year Costs	Annualized Costs ^b
<20 emp.	0	\$0	\$0	\$0
>20 emp. <500 lgwl	17	\$99.58	\$1,693	\$119
>500 emp. lgwl	3	\$99.58	\$299	\$21
Total First Year & Annualized Costs			\$1,992	\$139

^a \$99.58 = (2 x \$49.79): where 2 is the hours needed to prepare; and \$49.79 is a supervisor's hourly wage rate.

^b Annualized Costs = First Year Costs x 0.07, where 0.07 is the annualization factor.

Proposed § 70.212(b)
Cost to Give PAPR Training to Miners

There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers that would need to provide PAPR training to affected miners. MSHA assumes that 5 miners on a longwall MMU would need to wear PAPRs. These 5 miners are 3 jack setters, the headgate longwall operator, and the tailgate longwall operator. Since MSHA assumes, for cost purposes, that the affected longwall MMUs are in mines that operate 3 shifts per day, this means that 15 miners per longwall MMU would need to have training in the use of PAPRs. MSHA estimates that a mine supervisor would take about 30 minutes (0.5 hours) to give PAPR training to miners on each of the three shifts, and it is assumed that 5 miners would be trained per shift by the supervisor. This initial training would be given once to miners affected by the rule and would not have to be repeated, except for new employees. Thus, the first year costs have been annualized using an annualization factor of 7 percent.

Table IV-55 shows first year and annualized costs for affected longwall operators to train miners in the use of PAPRs.

Table IV-55: Proposed 70.212(b)
Total First Year and Annualized Costs for Longwall Operators to
Train Miners in the use of PAPRs as Required under the Proposed PV Rule

Ug. Coal Longwall Mine Size	MMUs	Training Cost (per MMU)^a	First Year Costs	Annualized Costs^b
<20 emp.	0	\$0	\$0	\$0
>20 emp. <500 lgwl	17	\$275.91	\$4,690	\$328
>500 emp. lgwl	3	\$275.91	\$828	\$58
Total First Year & Annualized Costs			\$5,518	\$386

^a \$275.91 = [(1 x 1.5 x \$49.79)+(15 x 0.5 x \$26.83)]: 1 = no. of supervisors to give training; \$49.79 = supervisor hourly wage rate; 1.5 = supervisor training time (takes 0.5 hrs. to train miners on each shift and 3 shifts would need training); 15 = no. of miners to be trained (5 miners per shift); 0.5 hrs. = time to train 1 miner; \$26.83 = miner's hourly wage rate.

^b Annualized Costs = First Year Costs x 0.07, where 0.07 is the annualization factor.

As a result of miner turnover, MSHA assumes that initial PAPR training would need to be repeated for new miners. Assuming an annual miner turnover rate of 7 percent for each affected longwall MMU, 7 percent of 15 miners (1 miner) would need to have PAPR training annually. Since all new miners are not hired at the same time, this training would be given by the supervisor to each new miner that is hired. MSHA estimates that a mine supervisor would take about 30 minutes (0.5 hours) to give PAPR training to a new miner.

Table IV-56 shows annual costs for longwall operators to train new miners in the use of PAPRs.

Table IV-56: Proposed 70.212(b)
Total Annual Costs for Longwall Operators to Train New Miners
in the use of a PAPR as Required under the Proposed PV Rule

Ug. Coal Longwall Mine Size	MMUs	Cost to Train New Miners (per MMU)^a	No. of New Miners to be Trained (per mine)^b	Annual Costs
<20 emp.	0	\$0	0	\$0
>20 emp. <500 lgwl	17	\$38.31	1	\$684
>500 emp. lgwl	3	\$38.31	1	\$121
Total Annual Costs				\$805

^a \$38.31 = (\$26.83 + \$49.79) x 0.5: \$26.83 = miner hourly wage rate; \$49.79 = supervisor hourly wage rate; 0.5 = number of hours of training.

^b 1 = (15 miners per mine x 7 percent).

Proposed § 70.212(b)
Cost to Purchase PAPRs

As noted earlier, each affected longwall MMU would have 5 persons that need to wear a PAPR. Assuming 2 extra replacement PAPRs per MMU, in addition to the original 5, each affected longwall MMU would need to purchase a total of 7 PAPRs for one shift. However, it has already been assumed that each affected longwall MMU operates 3 shifts per day; therefore, 21 (7 x 3) PAPRs per MMU would need to be purchased. The estimated purchase price for a PAPR is about \$550. This price was obtained from MSHA's Coal Mine Dust Division. A PAPR's estimated life is approximately 5 years.

There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers that would need to purchase PAPRs for the affected miners.

Table IV-57 shows first year and annualized costs for longwall operators to purchase PAPRs. The first year costs are annualized using an annualization factor of 0.244, which reflects a 7 percent annual discount rate and the fact that this equipment has a 5 year life.

Table IV-57: Proposed 70.212(b)

**Total First Year and Annualized Costs for Longwall Operators to Purchase PAPRs
as Required under the Proposed PV Rule**

Ug. Coal Longwall Mine Size	MMUs	Cost to Purchase a PAPR	No. of PAPRs to Purchase per MMU for 3 Shifts^a	First Year Costs	Annualized Costs^b
<20 emp.	0	0	0	\$0	\$0
>20 emp. <500 lgwl	17	\$550	21	\$196,350	\$47,909
>500 emp. lgwl	3	\$550	21	\$34,650	\$8,455
Total First Year & Annualized Costs				\$231,000	\$56,364

^a 21 PAPRs = (5 miners using PAPRs per longwall MMU plus 2 extra PAPR per MMU)
x 3 shifts per longwall MMU.

^b Annualized Costs = First Year Costs x 0.244, where 0.244 is the annualization factor.

Proposed § 70.212(b)
Cost to Mark Respirator and Record Date of Issuance

Each PAPR permanently assigned to an individual must be durably marked to indicate to whom it was assigned. In addition, the date of issuance must be recorded.

There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers where operators would need to mark the PAPRs and record the date of issuance. MSHA estimates that it would take a supervisor about 3 minutes (0.05 hours) to perform these functions (1.5 minutes to mark the respirator and another 1.5 minutes to record the date of issuance). As noted earlier, each affected longwall MMU would have 15 miners (5 miners per MMU x 3 shifts) to whom the operator would need to provide a PAPR. Replacement (or extra) PAPRs would not be assigned to an individual and thus would not have to be marked.

Table IV-58 shows first year and annualized costs for longwall operators to mark PAPRs and record the date of issuance. Since the above functions would need to be performed whenever the PAPRs are replaced (on average, every five years), the first year costs have been annualized using an annualization factor of 24.4 percent.

Table IV-58: Proposed 70.212(b)
Total First Year and Annualized Costs for Longwall Operators to
Permanently Mark Assigned PAPRs and Record Their Date of Issuance

Ug. Coal Longwall Mine Size	MMUs	Cost to Mark & Record a PAPR ^a	No. of PAPRs to Mark & Record (per MMU) ^b	First Year Costs	Annualized Costs ^c
<20 emp.	0	0	0	\$0	\$0
>20 emp. <500 lgwl	17	\$2.49	15	\$635	\$155
>500 emp. lgwl	3	\$2.49	15	\$112	\$27
Total First Year & Annualized Costs				\$747	\$182

^a \$2.49 = (0.05 x \$49.79): where 0.05 is the hours to mark the PAPR and record the date of issuance; \$49.79 is the supervisor's hourly wage rate.

^b 15 = (5 miners x 3 shifts per day).

^c Annualized Costs = First Year Costs x 0.244, where 0.244 is the annualization factor.

For new miners, operators would need to mark PAPRs and record the date of issuance. As noted earlier, miner turnover rate was estimated at approximately 7 percent. Thus, for each affected longwall MMU, the number of new miners would be 7 percent of 15 miners (or about 1 miner). Table IV-59 shows annual costs for longwall operators to mark PAPRs assigned to new miners and to record the date of issuance.

Table IV-59: Proposed 70.212(b)

**Total Annual Costs for Longwall Operators to Permanently Mark
PAPRs Assigned to New Miners and Record The Date of Issuance**

Ug. Coal Longwall Mine Size	MMUs	Cost to Mark & Record a PAPR^a	No. of PAPRs to Mark & Record (per MMU)^b	Annual Costs
<20 emp.	0	0	0	\$0
>20 emp. <500 lgwl	17	\$2.49	1	\$44
>500 emp. lgwl	3	\$2.49	1	\$8
Total Annual Costs				\$52

^a \$2.49 = (0.05 x \$49.79): where 0.05 is the hours to mark a PAPR and record the date of issuance; \$49.79 is the supervisor's hourly wage rate.

^b 1 = (15 miners per mine x 7 percent).

Proposed § 70.212(b)
Cost to Maintain PAPRs

MSHA estimates that certain accessories would be needed to maintain the efficient use of a PAPR on an annual basis. There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers that would need to maintain PAPRs annually.

Annually, each PAPR is assumed to need one face shield costing \$25, one battery costing \$75, and a headliner costing \$5. In addition, each PAPR filter must be changed at the end of each shift. The cost of a filter is about \$8. Assuming 6 workdays in a week for a longwall MMU, the number of filters needed for one PAPR used throughout the year is 312 (6 workdays x 52 weeks).

The time needed to replace a face shield, battery, or headliner is minimal. However, more is involved in replacing a filter, and MSHA estimates that it would take a miner about 0.2 hours (12 minutes) to replace a filter. Based on a miner hourly wage rate of \$26.83, the cost associated with replacing a filter would be \$5.37 (0.2 hours x \$26.83).

The total annual cost to maintain one PAPR (including time to replace a filter) would be \$4,276 [$\$25 + \$75 + \$5 + ((\$8 + \$5.37) \times 312)$]. Assuming 3 shifts per day for each longwall MMU and 5 miners wearing PAPRs on each shift, then 15 PAPRs would need to be maintained annually per mine.

Table IV-60 shows annual costs for longwall operators to

maintain PAPRs.

Table IV-60: Proposed 70.212(b)
Total Annual Costs for Longwall Operators to Maintain PAPRs

Ug. Coal Longwall Mine Size	MMUs	Cost to Maintain a PAPR ^a	No. of PAPRs to Maintain (per MMU) ^b	Annual Costs
<20 emp.	0	\$0	0	\$0
>20 emp. <500 lgwl	17	\$4,276	15	\$1,090,492
>500 emp. lgwl	3	\$4,276	15	\$192,440
Total Annual Costs				\$1,282,932

^a \$4,276 = (\$25+\$75+\$5+(\$8 + \$5.37) x 312)); \$25 for face shield;
\$75 for battery; \$5 for headliner; \$8 for filter that needs to be
changed every shift for each workday (312 workdays =
6 workdays x 52 weeks), and \$5.37 is time to change filter which is .
equal to 0.2 x miners' hourly wage rate of \$26.83.

^b 15 = (5 miners per mine x 3 shifts per day).

Proposed § 70.212(b)
Cost for Daily Inspection of PAPRs

Each workday that a PAPR is used it must be inspected before use to ensure that it is in proper working condition. The flow rate must be checked, as well as the physical condition of the helmet. Also, after each use (at the end of a shift), the PAPR must be cleaned and stored away. There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers where miners would need to have the PAPRs they use inspected, cleaned, and stored daily.

MSHA estimates that it would take a miner about 20 minutes (0.35 hours) per day to inspect, clean, and store a PAPR. Assuming 3 shifts per day for each longwall MMU and 5 miners wearing a PAPR on each MMU, then 15 PAPRs per mine are used frequently and would need to be inspected, cleaned, and stored each working day. Assuming that a longwall MMU operates 6 days per week, there are 312 workdays per year (6 workdays per week x 52 weeks) for which inspection, cleaning, and storage would take place.

Table IV-61 shows annual costs for longwall operators to inspect PAPRs that are used frequently.

Table IV-61: Proposed 70.212(b)

Total Annual Costs for Longwall Operators to Inspect, Clean, and Store PAPRs

Ug. Coal Longwall Mine Size	MMUs	Cost to Inspect a PAPR ^a	No. of PAPRs in Use Daily (per MMU) ^b	No. of Workdays PAPR is Inspected ^c	Annual Costs
<20 emp.	0	\$0	0	0	\$0
>20 emp. <500 lgwl	17	\$9.39	15	312	\$747,108
>500 emp. lgwl	3	\$9.39	15	312	\$131,843
Total Annual Costs					\$878,951

^a \$9.39 = (0.35 x \$26.83): where 0.35 is the time (in hrs.) to inspect, clean, and store a PAPR; and \$26.83 is a miner's hourly wage rate.

^b 15 = (5 miners per mine x 3 shifts per day).

Proposed § 70.212(b)

Cost for Monthly Inspection and Record of Emergency PAPRs

A PAPR that is not routinely used but is kept ready for emergency use must be inspected at least once a month to ensure that it is in satisfactory working condition. There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers in which the mine operator would need to inspect the emergency PAPRs monthly and then record the dates of inspection.

MSHA estimates that it would take a miner about 15 minutes (0.25 hours) to inspect the emergency PAPRs and about 1.5 minutes (0.025 hours) to record the date of the inspection. Thus, it would take 0.275 hours to inspect and record the date of inspection. As noted earlier, MSHA assumes that there are 2 replacement (or emergency) PAPRs purchased per affected longwall MMU that are for emergency use per shift. Since each affected longwall MMU operates 3 shifts there would be 6 emergency PAPRs for which mine operators would need to inspect monthly and recording the dates of inspection.

Table IV-62 shows annual costs for affected longwall operators to inspect and record the date of inspection of PAPRs that are kept for emergency use.

Table IV-62: Proposed 70.212(b)

**Total Annual Costs for Monthly PAPR Inspection and Recording of Inspection
Date for PAPRs Kept for Emergency Use**

Longwall Mine Size	MMUs	Cost to Inspect & Record Emergency PAPR^a	No. of Emergency PAPRs per MMU for 3 shifts^b	No. of Inspections (per yr.)^c	Annual Costs
<20 emp.	0	\$0	0	0	\$0
>20 emp. <500 lgwl	17	\$7.38	6	12	\$9,031
>500 emp. lgwl	3	\$7.38	6	12	\$1,594
Total Annual Costs					\$10,625

^a \$7.38 = (0.275 x \$26.83): where 0.275 is the time (in hrs.) to inspect and record inspection date for PAPR; and \$26.83 is a miner's hourly wage rate.

^b 6 = 2 emergency PAPRs per longwall MMU x 3 shifts per longwall MMU.

^c 1 = (1 inspection per month x 12 months).

Summary of Proposed PV Increased Costs

Table IV-63 provides a summary of each of the proposed PV cost provisions that were discussed above. This summary is broken down by mine size category.

Table IV-63:

Summary of Cost Increases to Underground Coal Mine Operators for Implementing the PV Rule *

Detail	Section	<20 Emp.				≥20 Emp. <500				>500 Emp.				Total			
		Adj. First Year Costs ^a	Annualized Costs	Annual Costs	Yearly Costs ^b	Adj. First Year Costs ^a	Annualized Costs	Annual Costs	Yearly Costs ^b	Adj. First Year Costs ^a	Annualized Costs	Annual Costs	Yearly Costs ^b	Adj. First Year Costs ^a	Annualized Costs	Annual Costs	Yearly Costs ^b
Write Rev. Vent. Plan	75.370/70.230(a)	\$57,120	\$3,998	\$13,194	\$17,193	\$252,082	\$17,646	\$54,968	\$72,614	\$15,466	\$1,083	\$3,485	\$4,568	\$324,668	\$22,727	\$71,648	\$94,375
Prepare & Send Plan	75.370(a)(2)&(3)	\$2,084	\$146	\$481	\$627	\$8,425	\$590	\$1,837	\$2,427	\$443	\$31	\$100	\$131	\$10,952	\$767	\$2,418	\$3,185
Post Revised Plan	75.370(a)(3)(iii)	\$813	\$57	\$188	\$245	\$3,369	\$236	\$735	\$970	\$177	\$12	\$40	\$52	\$4,358	\$305	\$962	\$1,267
Reschedule Sampling	70.205(d)	\$267	\$19	\$66	\$84	\$982	\$69	\$229	\$298	\$54	\$4	\$12	\$15	\$1,303	\$91	\$306	\$397
Corrective Actions	70.218(a)	\$941,538	\$65,908	\$330,245	\$396,153	\$7,022,032	\$491,542	\$1,345,311	\$1,836,854	\$683,683	\$47,858	\$87,989	\$135,847	\$8,647,253	\$605,308	\$1,763,546	\$2,368,854
Observe Sampling		\$10,126	\$709	\$2,039	\$2,748	\$91,434	\$6,400	\$20,388	\$26,789	\$12,272	\$859	\$2,379	\$3,238	\$113,831	\$7,968	\$24,806	\$32,774
Post Sample Results	70.220(a)	\$1,958	\$137	\$475	\$612	\$7,470	\$523	\$1,683	\$2,206	\$422	\$30	\$96	\$125	\$9,850	\$689	\$2,254	\$2,943
Write PAPR Prog.	70.211(b)/212(b)	\$0	\$0	\$0	\$0	\$8,622	\$1,224	\$0	\$1,224	\$1,522	\$216	\$0	\$216	\$10,144	\$1,440	\$0	\$1,440
Write Adm. Cont. Prog.	70.211(b)/216(a)	\$0	\$0	\$0	\$0	\$1,540	\$219	\$0	\$219	\$0	\$0	\$0	\$0	\$1,540	\$219	\$0	\$219
Rotate Workers	70.216(a)	\$0	\$0	\$0	\$0	\$0	\$0	\$12,556	\$12,556	\$0	\$0	\$0	\$0	\$0	\$0	\$12,556	\$12,556
Prepare for Training	70.212(b)	\$0	\$0	\$0	\$0	\$1,693	\$119	\$0	\$119	\$299	\$21	\$0	\$21	\$1,992	\$139	\$0	\$139
Give PAPR Training	70.212(b)	\$0	\$0	\$0	\$0	\$4,690	\$328	\$684	\$1,012	\$828	\$58	\$121	\$179	\$5,518	\$386	\$805	\$1,191
Purchase PAPRs	70.212(b)	\$0	\$0	\$0	\$0	\$196,350	\$47,909	\$0	\$47,909	\$34,650	\$8,455	\$0	\$8,455	\$231,000	\$56,364	\$0	\$56,364
Mark & Record PAPRs	70.212(b)	\$0	\$0	\$0	\$0	\$635	\$155	\$44	\$199	\$112	\$27	\$8	\$35	\$747	\$182	\$52	\$235
PAPR Maintenance	70.212(b)	\$0	\$0	\$0	\$0	\$0	\$0	\$1,090,492	\$1,090,492	\$0	\$0	\$192,440	\$192,440	\$0	\$0	\$1,282,932	\$1,282,932
Inspect & Clean PAPRs	70.212(b)	\$0	\$0	\$0	\$0	\$0	\$0	\$747,108	\$747,108	\$0	\$0	\$131,843	\$131,843	\$0	\$0	\$878,951	\$878,951
Inspect Emerg. PAPRs	70.212(b)	\$0	\$0	\$0	\$0	\$0	\$0	\$9,031	\$9,031	\$0	\$0	\$1,594	\$1,594	\$0	\$0	\$10,625	\$10,625
Total Plan Verif. Costs		\$1,013,905	\$70,973	\$346,688	\$417,662	\$7,599,324	\$566,960	\$3,285,067	\$3,852,027	\$749,927	\$58,653	\$420,105	\$478,758	\$9,363,156	\$696,586	\$4,051,861	\$4,748,447

* Source: Table IV-17 through Table IV-62. Only cost increases to mine operators are shown in this table.

^a For underground coal mines to comply with the PV rule, adjusted first year costs include some operating, maintenance, and replacement (OM&R) costs that are associated with the first year installation costs, but are not incurred until later years. When these later year OM&R costs are subtracted out, the adjusted first year costs borne by underground coal mines to comply with the PV rule would be \$3,050,661 rather than \$9,363,156. The adjusted first year costs by mine size, after subtracting out the later-year OM&R costs, would be \$326,582 for mines with fewer than 20 workers, \$2,473,241 for mines with 20 to 500 workers, and \$250,838 for mines with more than 500 workers. Total first year cost, including annual costs, borne by underground coal mines to comply with the PV rule would therefore be \$7,102,521 (\$673,270 for mines with fewer than 20 workers, \$5,758,308 for mines with 20 to 500 workers, and \$670,943 for mines with more than 500 workers).

PART 2 - COST REDUCTIONS RELATED TO THE NUMBER OF CITATIONS ISSUED BASED ON MSHA INSPECTOR SAMPLE RESULTS

As noted earlier, the proposed PV rule would cause fewer MSHA inspector MMU and RB-DA citations to be issued that are based on MSHA inspector sample results. The I-DA, O-DA, and P-90 citations should also decrease.³⁷ The reason for this reduction is because the proposed PV rule would induce mine operators to improve their mine ventilation plans, which would result in fewer citations issued for overexposures. Therefore, mine operators' compliance costs for citations based on MSHA inspector sample results would need to be reduced as a result of the implementation of the PV rule.³⁸

In addition, currently, if MSHA inspector sample results showed an overexposure, then the mine operator would perform the abatement sampling that is related to the overexposure. However, with the elimination of bi-monthly operator sampling, the bi-monthly sampling, as well as the abatement sampling, would be performed by MSHA inspectors instead of the mine operators. Therefore, there are certain operator costs that would not occur because the act of performing abatement sampling, in this case, would have been shifted from mine operators to MSHA inspectors.

Concerning operator cost reductions related to citations

³⁷ The proposed PV rule does not cover surface coal mines or surface areas of underground coal mines and therefore would not affect the DWP and NDWP inspector citations that are issued there.

³⁸ Note that compliance with the proposed PV rule would reduce the number of all inspector underground coal mine citations based on a SFSS, not just the number of additional citations arising from the proposed SFSS rule.

issued based on MSHA inspector sample results, MSHA assumes the following:

Annually, beginning in the first year that the proposed PV rule is effective, costs related to 100 percent of the citations would be eliminated in the following areas: abatement sampling; completing dust data cards; and sending samples and dust cards to MSHA. This is because with the elimination of bi-monthly sampling by operators these costs would no longer arise for them.

Every year after the first year that the proposed PV rule is in effect, costs related to 90 percent of the citations issued based on MSHA inspector sample results would be eliminated in the following areas: corrective actions; posting sampling results; writing dust plans; and posting or giving dust plans to the appropriate parties.³⁹ The first year the proposed PV rule is in effect would be a "transition" year during which ventilation plans will be verified. For that reason, the PV rule would only be half as effective in eliminating citations the first year as in later years. Therefore, the cost reduction the first year would only be 45 percent in these areas.

The above percentages were obtained from discussions with technical staff in MSHA's Coal Mine and Health Division. MSHA requests comments and any available data concerning the percentage reduction in citations that would be expected as a result of the implementation of the proposed PV rule.

Table IV-64 shows, by mine size and type, MSHA's estimate of the number of annual citations based on MSHA inspector sample results.

Table IV-65 shows, by mine size and type, a 45 percent

³⁹ With respect to posting sample results, it is true that mine operators would no longer have to post sample results from abatement samples that they no longer take. However, proposed § 70.220(a) of the PV rule requires that all MSHA sample results be posted. Therefore, abatement sampling results would still need to be posted by mine operators. The only difference is that the abatement sampling results posted would be those that are taken by MSHA inspectors instead of by mine operators.

reduction in the citations noted in Table IV-64, expected in the first year that the PV rule is in effect.

Table IV-66 shows, by mine size and type, an 90 percent reduction in the citations noted in Table IV-64, expected annually after the first year that the PV rule is in effect.

Table IV-64:
Annual Number of Citations
Issued Based on MSHA Inspector Sample Results ^(*)
(100% of Citations)

Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	123	65	0	1	1	N/A	N/A	190
≥20 emp. ≤500	353	170	2	16	6	N/A	N/A	547
>500 emp.	20	0	0	0	0	N/A	N/A	20
Ug. Total	496	235	2	17	7	N/A	N/A	757

(*) PV rule would not affect DWP and NDWP citations in underground coal mines or citations at surface coal mines. The 757 citations include the additional citations resulting from the SFSS rule

Table IV-65:
First Year Reduction in the Number of Citations
Issued Based on MSHA Inspector Sample Results ^(*)
(45% of Citations from Table IV-64)

Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	56	29	0	0	0	N/A	N/A	85
≥20 emp. ≤500	159	76	1	7	3	N/A	N/A	246
>500 emp.	9	0	0	0	0	N/A	N/A	9
Ug. Total	224	105	1	7	3	N/A	N/A	340

^(*) PV rule would not affect DWP and NDWP citations in underground coal mines or citations at surface coal mines.

Table IV-66:
Annual Reduction in the Number of Citations
Issued Based on MSHA Inspector Sample Results ^(*)
(90% of Citations from Table IV-64)

Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	111	58	0	1	1	N/A	N/A	171
≥20 emp. ≤500	318	153	2	14	5	N/A	N/A	492
>500 emp.	18	0	0	0	0	N/A	N/A	18
Ug. Total	447	211	2	15	6	N/A	N/A	681

^(*) The annual 80 percent reduction starts in the second year after the proposed PV rule takes effect. PV rule would not affect DWP and NDWP citations in underground coal mines or citations at surface coal mines.

MSHA used the ratio of longwall MMUs to non-longwall MMUs in Table IV-19 to separate the citations in Table IV-64, Table IV-65, and Table IV-66 between mines with and without longwall operations. This was done based on the assumption that the percentage of citations per MMU is twice as high for longwall MMUs as for non-longwall MMUs. The ratio of longwall MMUs to non-longwall mines was adjusted to reflect this fact. Thus, Table IV-67 shows citations and citations prevented by the proposed PV rule dis-aggregated by mine size category and by non-longwall and longwall categories.

Table IV-67:
Citations Issued Based on MSHA Inspector Sample Results
by Mine Size Category
and Non-longwall and Longwall Category

Mine Size	100% of Citations ^a	45% of Citations in First Year of PV Rule	90% of Citations Annually After First Year of PV Rule
Underground Coal Mines			
<20 emp.	190	85	171
>20 emp. ≤500 no lgwl	482	217	433
>20 emp. ≤500 lgwl	65	29	59
Sub-Total	547	246	492
>500 emp. no lgwl	14	6	12
>500 emp. lgwl	6	3	6
Sub-total	20	9	18
Total Annual Ug. Citations	757	340	681

^a The 757 citations includes the additional citations from the SFSS rule.

The 100 percent of citations noted in Table IV-67 will be used to derive cost reductions related to abatement sampling, completing dust data cards, and sending samples and dust cards to MSHA.

The 40 percent and 80 percent of citations noted in Table IV-67 will be used to derive cost reductions for corrective actions, posting sampling results, writing dust plans, and

posting or giving dust plans to the appropriate parties.

Corrective Action Cost Reductions Related to the Reduced
Number of Citations Issued Based on MSHA Inspector Sample
Results

To calculate the corrective action cost savings that are related to the reduction in the number of citations based on MSHA inspector sample results, MSHA used the same corrective action cost figures that were derived earlier when calculating the corrective action compliance costs associated with additional citations in the proposed SFSS cost analysis. As determined earlier, for underground mines, the corrective action costs were \$1,519 for an MMU or RB-DA citation in a non-longwall mine, and \$2,056 for an MMU or RB-DA citation in a longwall mine. For all other types of citations issued in underground mines, costs for the corrective actions were estimated at \$200 per citation in mines that employ fewer than 20 workers and \$400 per citation in mines that employ 20 or more workers. These corrective actions would also generate an associated stream of annual operating, maintenance, and replacement (OM&R) costs. MSHA estimates that these OM&R costs each year would be equal to approximately 25 percent of the original installation costs.⁴⁰

⁴⁰ The discounted present value of the annual OM&R costs is equal to:

$$S = \sum_{i=1}^{\infty} (0.25 \times C) / (1 + 0.07)^i$$

where C is the cost of installing the corrective action, 0.07 is the discount rate, and i represents the nth year after the proposed rule takes effect. This equation for S can be simplified to equal (0.25 x C/0.07).

Furthermore, as MSHA previously assumed, corrective actions unique to the proposed SFSS cost analysis would have been taken for only 40 percent of the (additional) citations issued to non-longwall underground mines and 60 percent of the (additional) citations issued to underground longwall operators. These same percentages would apply to the operator savings from a reduction in citations issued based on MSHA inspector sample results.

Table IV-68 shows the mine operators' first year corrective action cost decrease related to a 45 percent reduction in the number of citations issued based on MSHA inspector sample results.⁴¹

Table IV-69 shows the mine operators' annual corrective action cost decrease (including an equivalent amount for the first year as derived in the previous table) related to a 90 percent reduction in the number of citations issued based on MSHA inspector sample results.

⁴¹ Note that the adjusted first year corrective action cost reduction is a negative number. This is because, even though the first year corrective action cost reduction is positive it is less than the annual cost reduction in each subsequent year. Therefore, a negative adjustment is required.

Table IV-68: First Year and Annualized Corrective Action Cost Reductions Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

	No. of Reduced MMU & RB-DA Citations ^a	No. of Reduced I-DA, O-DA & P-90 Citations ^a	Corrective Action Cost Reductions Related to MMU & RB-DA (per Citation) ^b	Corrective Action Cost Reductions Related to I-DA O-DA, & P-90 (per Citation) ^c	First Year SFSS Cost Reductions ^d
Mine size					
Underground Mines					
<20 emp.	34.0	0	\$6,944	\$914	\$236,096
>20 emp. ≤500 no lgwl	83.2	3.6	\$6,944	\$1,829	\$584,324
>20 emp. ≤500 lgwl	16.2	1.2	\$9,399	\$1,829	\$154,456
Sub-total	99.4	4.8			\$738,779
>500 emp. no lgwl	2.4	0	\$6,944	\$0	\$16,666
>500 emp. lgwl	1.8	0	\$9,399	\$0	\$16,918
Sub-total	4.2	0			\$33,584
First Year Cost Reductions					\$1,008,459
Adjusted First Year Cost Reductions Annualized					
	First Year Cost Reductions	Annual Cost Reductions ^e	Adjusted Total First Year Cost Reductions ^f	Adjusted First Year Cost Reductions Annualized ^g	
Mine size					
<20 emp.	\$236,096	\$470,146	-\$234,050	-\$16,383	
>20 emp. ≤500 no lgwl	\$584,324	\$1,165,870	-\$581,546	-\$40,708	
>20 emp. ≤500 lgwl	\$154,456	\$319,093	-\$164,637	-\$11,525	
Sub-total	\$738,779	\$1,484,963	-\$746,183	-\$52,233	
>500 emp. no lgwl	\$16,666	\$33,331	-\$16,666	-\$1,167	
>500 emp. lgwl	\$16,918	\$33,836	-\$16,918	-\$1,184	
Sub-total	\$33,584	\$67,167	-\$33,584	-\$2,351	
Cost Reductions	\$1,008,459	\$2,022,276	-\$1,013,817	-\$70,967	

^a With respect to the 40% reduction in citations (from Table IV-67), we assume that 40% of citations in non-lgwl mines would involve corrective actions and 60% of citations in lgwl mines would involve corrective action. The relative share of MMU & RB-DA citations to I-DA, O-DA, and P-90 citations was derived from Table IV-65.

^b For non-longwall MMUs & RB-DAs \$6,944 = first year cost of Y, where $Y = P + ((0.25 \times P)/0.07)$. P = average cost of first year corrective action of \$1,519 = $(0.50 \times \$525) + (0.75 \times \$1,275) + (0.50 \times \$600)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For longwall MMUs & RB-DAs \$9,399 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$2,056 = $(0.20 \times \$750) + (0.25 \times \$1,525) + (1 \times \$1,525)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^c For other citations in ug. non-longwall mines employing fewer than 20 workers
\$914 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$200; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For other citations in ug. longwall mines and surface mines employing 20 to 500 workers:
\$1,829 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$400; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^d Cost formula = (no. of reduced MMU & RB-DA citations x MMU & RB-DA correction action costs) + (no. of reduced I-DA, O-DA & P-90 citations x I-DA, O-DA, & P-90 corrective action costs).

^e An amount equivalent to annual cost reductions from Table IV-69

^f Adjusted first year cost reductions equal first year cost reductions minus annual cost reductions

^g Adjusted total first year cost reductions annualized equals adjusted first year cost reductions times 0.07, where 0.07 is the annualization factor.

Table IV-69: Annual Corrective Action Cost Reductions Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

Mine size	No. of Reduced MMU & RB-DA Citations ^a	No. of Reduced I-DA, O-DA & P-90 Citations ^a	Corrective Action Cost Reductions Related to MMU & RB-DA (per Citation) ^b	Corrective Action Cost Reductions Related to I-DA O-DA, & P-90 (per Citation) ^c	Annual SFSS Cost Reductions ^d
Underground Mines					
<20 emp.	67.6	0.8	\$6,944	\$914	\$470,146
>20 emp. ≤500 no lgwl	166	7.2	\$6,944	\$1,829	\$1,165,870
>20 emp. ≤500 lgwl	33.6	1.8	\$9,399	\$1,829	\$319,093
Sub-total	199.6	9			\$1,484,963
>500 emp. no lgwl	4.8	0	\$6,944	\$0	\$33,331
>500 emp. lgwl	3.6	0	\$9,399	\$0	\$33,836
Sub-total	8.4	0			\$67,167
Annual Cost Reductions					\$2,022,276

^a With respect to the 80 percent reduction in citations (from Table IV-67), we assume that 40 percent of citations in non-longwall mines would involve corrective actions and 60 percent of citations in longwall mines would involve corrective action. The relative share of MMU & RB-DA citations to I-DA, O-DA, and P-90 citations was derived from Table IV-66.

^b For non-longwall MMUs & RB-DAs \$6,944 = first year cost of Y, where $Y = P + ((0.25 \times P)/0.07)$. P = average cost of first year corrective action of \$1,519 = $(0.50 \times \$525) + (0.75 \times \$1,275) + (0.50 \times \$600)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For longwall MMUs & RB-DAs \$9,399 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective of action \$2,056 = $(0.20 \times \$750) + (0.25 \times \$1,525) + (1 \times \$1,525)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^c For other citations in ug. non-longwall mines employing fewer than 20 workers:
\$914 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$200; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For other citations in ug. longwall mines and surface mines employing 20 to 500 workers:
\$1,829 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$400; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^d Cost formula = (no. of reduced MMU & RB-DA citations x MMU & RB-DA correction action costs) + (no. of reduced I-DA, O-DA & P-90 citations x I-DA, O-DA, & P-90 corrective action costs).

Existing §§ 70.201(d) & 90.201(d)
Annual Abatement Sampling Cost Reductions Related to the
Number of Citations Issued Based on MSHA Inspector Sample
Results

As previously noted in order to abate an MSHA inspector citation, the mine operator must take abatement samples after corrective actions are taken. However, with the elimination of bi-monthly sampling by operators all sampling responsibility for operators are eliminated, which includes abatement sampling for citations issued based on MSHA inspector sample results. Therefore, beginning in the first year and continuing annually, operators would realize a cost reduction for no longer having to perform abatement sampling that applies to 100 percent of the citations noted in Table IV-64.

Currently, the operator takes a set of 5 single full-shift abatement samples on different shifts, for each citation received. To estimate the abatement sampling cost reductions, this analysis assumes that operators would be able to come back into compliance after their first set of 5 abatement samples. A second set of 5 abatement samples would not be needed.

As noted earlier, abatement sampling costs are not the same for all coal mine operators. Some operators perform their own sampling with their own sampling equipment. Other operators perform their own sampling but do not own any equipment and thus must rent the sampling equipment. Finally, some operators transfer their sampling responsibilities to contractors who

perform the sampling with their (the contractors') own equipment. Table IV-7 shows the estimated breakdown of underground and surface coal mine operators by the way they sample.

The sampling rates in Table IV-8, which were derived by utilizing the three different sampling methods in Table IV-7, are used in Table IV-70 to determine mine operators' annual abatement sampling cost reduction for 100 percent of the citations issued based on MSHA inspector sample results.

Table IV-70: Existing 70.201(d) & 90.201(d)
Total Annual Abatement Sampling Cost Reductions Related to the Reduced
Number of Citations Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Citations ^a	No. of Samples Per Citation	Cost Per Sample ^b	Total Annual SFSS Cost Reductions
Underground Coal Mines				
<20 emp.	190	5	\$64.43	\$61,209
≥20 emp. ≤500 no lgwl	482	5	\$62.59	\$150,832
≥20 emp. ≤500 lgwl	65	5	\$37.65	\$12,236
Sub-Total	547			\$163,067
>500 emp. no lgwl	14	5	\$37.65	\$2,635
>500 emp. lgwl	6	5	\$37.65	\$1,129
Sub-Total	20			\$3,765
Annual Cost Reductions				\$228,041

^a A reduced number of Citations from Table IV-64.

^b \$64.43 = (0.63 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter))+
(0.33 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+75 equip.))+
(0.04 x \$200).

\$62.59 = (0.66 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter))+
(0.30 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$75 equip.))+
(0.04 x \$200).

\$37.65 = (0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter.

Existing §§ 70.209(c) & 90.209(c)
Annual Abatement Sampling Dust Data Cards Cost Reductions
Related to the Reduced Number of Citations Issued Based on
MSHA Inspector Sample Results

After each abatement sample is taken, a dust data card must be filled out. The card is provided by the manufacturer when the mine operator purchases a filter cassette. After the information is recorded on the card, a certified person signs it and writes his certification number on the card. MSHA estimates that after each sample it would take 0.025 hours (about 1.5 minutes) for a mine safety inspector, or equivalent person, to complete and sign the dust data card. The mine safety inspector per hour wage rate is similar to a mine supervisor's wage rate of \$49.79. Since operators would no longer perform abatement sampling, the above costs would be avoided.

Table IV-71 shows underground coal mine operators' annual cost reduction associated with dust data cards for abatement samples due to the elimination of 100 percent of the citations issued based on MSHA inspector sample results. The dust data cards cost reductions shown in Table IV-71 are adjusted to reflect the different methods of sampling. For instance, there are no cost reductions related to dust data cards for operators who contract out sampling.

Table IV-71: Existing 70.209(c)
Total Annual Cost Reductions for Completing Dust Cards for
Abatement Samples Related to Reduced Number of Citations
Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Citations ^a	No. of Samples Per Citation	Cost for Dust Data Card ^b	Total Annual SFSS Cost Reductions
Underground Coal Mines				
<20 emp.	190	5	\$1.19	\$1,135
≥20 emp. ≤500 no lgwl	482	5	\$1.19	\$2,880
≥20 emp. ≤500 lgwl	65	5	\$1.24	\$405
Sub-Total	547			\$3,284
>500 emp. no lgwl	14	5	\$1.24	\$87
>500 emp. lgwl	6	5	\$1.24	\$37
Sub-Total	20			\$124
Total Ug. Annual Costs				\$4,544

^a A reduced number of citations from Table IV-67.

^b Ug. mines <20 emp:

$$\$1.19 = (0.63 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.33 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.04 \times \$0).$$

Ug. non-longwall mines ≥20 emp. ≤500:

$$\$1.19 = (0.66 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.30 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.04 \times \$0).$$

$$\$1.24 = (1 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})).$$

Existing §§ 70.209(a) & 90.209(a)
Annual Cost Reductions to Send Abatement Samples and Dust
Cards to MSHA Related to the Reduced Number of Citations
Issued Based on MSHA Inspector Sample Results

Each abatement sample along with its dust data card is sent by mine operators who perform their own sampling to an MSHA laboratory for analysis. For mine operators who contract out their sampling, the samples and dust data cards are sent to MSHA by the contractor who does the sampling. MSHA estimates that it takes a certified dust technician about 0.0833 hours (or 5 minutes) to prepare and send in one sample along with any relevant data to MSHA. The cost of postage to send in 1 sample is estimated to be about \$0.50. Since operators would no longer perform abatement sampling, the above costs would be avoided.

Table IV-72 shows underground coal mine operators' annual cost decrease related to sending to MSHA for analysis the abatement samples and dust data cards due to the elimination of 100 percent of citations issued based on MSHA inspector sample results. There are no compliance cost reductions in Table IV-72 related to sending abatement samples and dust data cards to MSHA for operators that contract out sampling.

Table IV-72: Existing 70.209(a) & 90.209(a)
Total Annual Cost Reductions to Send Abatement Samples and Dust Cards to
MSHA for Analysis Related to the Reduced Number of Citations Issued
Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Citations ^a	No. of Samples Per Citation	Cost to Send Sample and Dust Card to MSHA ^b	Total Annual SFSS Cost Reductions
Underground Coal Mines				
<20 emp.	190	5	\$2.00	\$1,899
>20 emp. ≤500 no lgwl	482	5	\$2.00	\$4,819
≥20 emp. ≤500 lgwl	65	5	\$2.08	\$677
Sub-Total	547			\$5,495
>500 emp. no lgwl	14	5	\$2.08	\$146
>500 emp. lgwl	6	5	\$2.08	\$62
Sub-Total	20			\$208
Annual Cost Reductions				\$7,603

^a A reduced number of citations from Table IV-67.

^a For ug. mines that employ fewer than 20 workers \$2.00 =
 $(0.63 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)) + (0.33 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)).$

For ug. non-longwall mines that employ between 20 and 500 workers \$2.00 =
 $(0.66 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)) + (0.30 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)).$

\$2.08 = $1 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50).$

Existing §§ 70.210(b) & 90.210(b)
Annual Cost Reductions to Post Abatement Sample Results
Related to the Reduced Number of Citations Issued Based on
MSHA Inspector Sample Results

After MSHA has analyzed the abatement samples, the Agency sends the sample results back to the mine operator. Upon receiving the sample results, the mine operator must post them on the mine bulletin board. For costing purposes, it is assumed that the 5 abatement sample results are sent back to the mine operator on one page. Thus, for each citation, one page worth of sample results needs to be posted. MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and post the results. Photocopying costs per page are estimated to be \$0.15. For the eliminated citations, the above costs would be avoided.

With respect to part 90 citations, existing § 90.210(b) states that the mine operator does not need to post the sample results, but rather to give a copy to the miner. MSHA assumes that it would take the same amount of time to copy and give the results to the miner as it would to copy and post the results.

Table IV-73 shows operators' first year and annualized cost decrease associated with posting sample results related to the 45 percent reduction in the number of citations issued based on MSHA inspector sample results.⁴²

⁴² Note that the adjusted first year cost reduction is a negative number. This is because, even though the first year cost reduction is positive, it is less than the annual cost reduction in each subsequent year. Therefore, a negative adjustment is required.

Table IV-74 shows operators' annual cost decrease associated with posting sample results (including an equivalent amount for the first year as derived in the previous table) that is related to the 90 percent reduction in the number of citations issued based on MSHA inspector sample results.

**Table IV-73: Existing 70.210(b) & 90.210(b)
First Year and Annualized Cost Reductions to Post Abatement Sample
Results that are Related to the Reduced Number of Citations
Issued Based on MSHA Inspector Sample Results**

Mine Size	No. of Reduced Citations ^a	Cost to Post Sample Results Per Citation ^b	First Year SFSS Cost Reduction
Underground Coal Mines			
<20 emp.	85	\$2.01	\$171
>20 emp. ≤500 no lgwl	217	\$2.01	\$435
>20 emp. ≤500 lgwl	29	\$2.01	\$58
Sub-Total	246		\$493
>500 emp. no lgwl	6	\$2.01	\$11
>500 emp. lgwl	3	\$2.01	\$6
Sub-Total	9		\$17
First Year Costs Reductions			\$681
Adjusted First Year Cost Reductions Annualized			
Mine Size	Annual Cost Reductions ^c	Adjusted Total First Year Cost Reductions ^d	Adjusted First Year Cost Reductions Annualized ^e
<20 emp.	\$343	-\$173	-\$12.08
>20 emp. ≤500 no lgwl	\$869	-\$433	-\$30.33
>20 emp. ≤500 lgwl	\$118	-\$60	-\$4.21
Sub-Total	\$987	-\$493	-\$35
>500 emp. no lgwl	\$24	-\$13	-\$0.91
>500 emp. lgwl	\$12	-\$6	-\$0.42
Sub-Total	\$36	-\$19	-\$1
Cost Reductions	\$1,366	-\$685	-\$48

^a A reduced number of citations from Table IV-67.

^b \$2.01 = (0.1 hr. x \$18.56)+(1 pg. x \$0.15).

^c An amount equivalent to annual cost reductions from Table IV-74.

^d Adjusted first year cost reductions equal first year cost reductions minus annual cost reductions.

^e Adjusted total first year cost reductions annualized equals adjusted first year cost reductions times 0.07, where 0.07 is the annualization factor.

Table IV-74: Existing 70.210(b) & 90.210(b)
Annual Cost Reductions to Post Abatement Sample
Results that are Related to the Reduced Number of Citations
Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Citations ^a	Cost to Post Sample Results Per Citation ^b	Total Annual SFSS Cost Reductions
Underground Coal Mines			
<20 emp.	171	\$2.01	\$343
>20 emp. ≤500 no lgwl	433	\$2.01	\$869
>20 emp. ≤500 lgwl	59	\$2.01	\$118
Sub-Total	492		\$987
>500 emp. no lgwl	12	\$2.01	\$24
>500 emp. lgwl	6	\$2.01	\$12
Sub-Total	18		\$36
Annual Cost Reductions			\$1,366

^a A reduced number of citations from Table IV-67.

^b \$2.01 = (0.1 hr. x \$18.56)+(1 pg. x \$0.15).

Existing § 90.300(a)

Annual Cost Reductions to Submit Plan Related to the Reduced
Number of Citations Issued Based on MSHA Inspector Sample
Results

An operator must write and submit to MSHA a respirable dust control plan after a part 90 citation has been abated. Under § 90.300(a), the mine operator must submit a written plan for that part 90 miner involved in the citation. MSHA estimates that it would take a mine supervisor an average of 3 hours to write a plan. For the eliminated citations, the above costs would be avoided.

Table IV-75 shows operators' first year and annualized cost decrease associated with writing a respirable dust control plan related to the 45 percent reduction in the number of Part 90 citations (3 citations in mines that employ between 20 to 500 workers) issued based on MSHA inspector sample results.⁴³

Table IV-76 shows operators' annual cost decrease associated with writing a respirable dust control plan (including an equivalent amount for the first year as derived in the previous table) that is related to the 90 percent reduction in the number of Part 90 citations (6 citations, 1 in mines that employ fewer than 20 workers, and 5 in mines that employ between 20 to 500 workers) issued based on MSHA inspector sample results.

⁴³ Note that the adjusted first year cost reduction is a negative number. This is because, even though the first year cost reduction is positive, it is less than the annual cost reduction in each subsequent year. Therefore, a negative adjustment is required.

**Table IV-75: Existing 90.300(a)
First Year and Annualized Cost Reductions to Write Dust
Control Plan Relating to the Reduced Number of Citations Issued
Based on MSHA Inspector Sample Results**

Mine Size	Reduced No. of Dust Plans to Write ^a	Cost to Write Dust Plans (Per Citation) ^b	First Year SFSS Cost Reductions
Underground Coal Mines			
<20 emp.	0	\$149.37	\$0
>20 emp. ≤500 no lgwl	2	\$149.37	\$299
>20 emp. ≤500 lgwl	1	\$149.37	\$149
Sub-Total	3		\$448
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
First Year Cost Reductions			\$448
Adjusted First Year Cost Reductions Annualized			
Mine Size	Annual Cost Reductions ^c	Adjusted Total First Year Cost Reductions ^d	Adjusted First Year Cost Reductions Annualized ^e
<20 emp.	\$149	-\$149	-\$10.46
>20 emp. ≤500 no lgwl	\$597	-\$299	-\$20.91
>20 emp. ≤500 lgwl	\$149	\$0	\$0.00
Sub-Total	\$747	-\$299	-\$21
>500 emp. no lgwl	\$0	\$0	\$0
>500 emp. lgwl	\$0	\$0	\$0
Sub-Total	\$0	\$0	\$0
Cost Reductions	\$896	-\$448	-\$31

^a A reduced number of citations from Table IV-65.

^b \$149.37 = 3 hours x \$49.79.

^c An amount equivalent to annual cost reductions from Table IV-76.

^d Adjusted first year cost reductions equal first year cost reductions minus annual cost reductions.

^e Adjusted total first year cost reductions annualized equals adjusted first year cost reductions times 0.07, where 0.07 is the annualization factor.

**Table IV-76: Existing 90.300(a)
Annual Cost Reductions to Write Dust Control Plan
Relating to the Reduced Number of Citations Issued
Based on MSHA Inspector Sample Results**

Mine Size	Reduced No. of Dust Plans to Write ^a	Cost to Write Dust Plans (Per Citation) ^b	Total Annual SFSS Cost Reductions
Underground Coal Mines			
<20 emp.	1	\$149.37	\$149
>20 emp. ≤500 no lgwl	4	\$149.37	\$597
>20 emp. ≤500 lgwl	1	\$149.37	\$149
Sub-Total	5		\$747
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
Annual Cost Reductions			\$896

^a A reduced number of citations from Table IV-66.

^b \$149.37 = 3 hours x \$49.79.

Existing § 90.301(d)
Annual Cost Reductions to Provide Copy of Dust Plan Related
to the Reduced Number of Citations Issued Based on MSHA
Inspector Sample Results

Once mine operators have an approved respirable dust control plan, under § 90.301(d), the operator must provide a copy of the approved respirable dust control plan to the part 90 miner.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and provide the plan to the P-90 miner. On average, the plan is estimated to be about 5 pages. Photocopying costs per page are estimated to be \$0.15. For the reduced citations, the above costs would be avoided.

Table IV-77 shows operators' first year and annualized cost decrease associated with copying the plan and giving it to a miner related to the 45 percent reduction in the number of Part 90 citations (3 citations in mines that employ between 20 to 500 workers) issued based on MSHA inspector sample results.⁴⁴

Table IV-78 shows operators' annual cost decrease associated with copying a plan and giving it to a miner (including an equivalent amount for the first year as derived in the previous table) that is related to the 90 percent reduction in the number of Part 90 citations (6 citations, 1 in mines that employ fewer than 20 workers, and 5 in mines that employ between 20 to 500 workers) issued based on MSHA inspector sample results.

⁴⁴ Note that the adjusted first year cost reduction is a negative number. This is because, even though the first year cost reduction, is positive, it is less than the annual cost reduction in each subsequent year. Therefore, a negative adjustment is required.

**Table IV-77: Existing 90.301(d)
First Year and Annualized Cost Reductions to Post or Provide Miners'
With a Copy of the Dust Plan Related to the Reduced Number of Citations
Issued Based on MSHA Inspector Sample Results**

Mine Size	Reduced No. of Dust Plans ^a	Cost to Post or Provide Dust Plans (Per Citation) ^b	First Year SFSS Cost Reductions
Underground Coal Mines			
<20 emp.	0	\$2.61	\$0
>20 emp. ≤500 no lgwl	2	\$2.61	\$5
>20 emp. ≤500 lgwl	1	\$2.61	\$3
Sub-Total	3		\$8
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
First Year Reductions			\$8
Adjusted First Year Cost Reductions Annualized			
Mine Size	Annual Cost Reductions ^c	Adjusted Total First Year Cost Reductions ^d	Adjusted First Year Cost Reductions Annualized ^e
<20 emp.	\$3	-\$3	-\$0.18
>20 emp. ≤500 no lgwl	\$3	\$3	\$0.18
>20 emp. ≤500 lgwl	\$10	-\$8	-\$0.55
Sub-Total	\$13	-\$5	\$0
>500 emp. no lgwl	\$0	\$0	\$0
>500 emp. lgwl	\$0	\$0	\$0
Sub-Total	\$0	\$0	\$0
Cost Reductions	\$16	-\$8	-\$1

^a A reduced number of citations from Table IV-65.

^b \$2.61 = (\$18.56 clerical wage rate x 0.1 hour) +
(\$0.15 copy costs x 5 pgs. per plan).

^c An amount equivalent to annual cost reductions from Table IV-78.

^d Adjusted first year cost reductions equal first year cost reductions minus
annual cost reductions.

^e Adjusted total first year cost reductions annualized equals adjusted first year
cost reductions times 0.07, where 0.07 is the annualization factor.

Table IV-78: Existing 90.301(d)

**Total Annual Cost Reductions to Post or Provide Miners' With
a copy of the Dust Plan Related to the Reduced Number of Citations
Issued Based on MSHA Inspector Sample Results**

Mine Size	Reduced No. of Dust Plans ^a	Cost to Post or Provide Dust Plans (Per Citation) ^b	Total Annual SFSS Cost Reductions
Underground Coal Mines			
<20 emp.	1	\$2.61	\$3
>20 emp. ≤500 no lgwl	1	\$2.61	\$3
>20 emp. ≤500 lgwl	4	\$2.61	\$10
Sub-Total	5		\$13
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
Annual Cost Reductions			\$16

^a A reduced number of citations from Table IV-66.

^b \$2.61 = (\$18.56 clerical wage rate x 0.1 hour) +
(\$0.15 copy costs x 5 pgs. per plan).

Annual Penalty Cost Reductions Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

Once a mine operator is issued a citation, the operator is assessed a monetary penalty. Even if an operator successfully abates the citation with abatement samples, the operator must still pay the monetary penalty. The dollar amount of the penalty is not the same for every citation; its determination is based upon a set of criteria that is set forth in 30 CFR §100.3. Table IV-14, provides recent average penalties for each kind of citation.

Table IV-79 derives the first year and annualized penalty cost reductions for the 45 percent reduction in the number of citations issued based on MSHA inspector sample results.⁴⁵ Table IV-79 uses average costs per penalty from Table IV-14 and the citations from Table IV-65 to derive penalty costs.

Table IV-80 derives the annual penalty cost reductions for the 90 percent reduction in the number of citations issued based on MSHA inspector sample results. Table IV-80 uses average costs per penalty from Table IV-14 and the citations from Table IV-66 to derive penalty cost reductions.

⁴⁵ Note that the adjusted first year penalty cost reduction is a negative number. This is because, even though the first year cost reduction, is positive, it is less than the annual cost reduction in each subsequent year. Therefore, a negative adjustment is required.

**Table IV-79: First Year and Annulaized Penalty Cost Reductions
Related to the Reduced Number of Citations Issued
Based on MSHA Inspector Sample Results**

Penalty Compliance Cost Reductions ^a								
Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	First Year Penalty Cost Reductions
Underground Coal Mines								
<20 emp.	\$9,800	\$4,669	\$0	\$0	\$0	N/A	N/A	\$14,469
≥20 emp. ≤ 500	\$78,069	\$22,192	\$267	#####	\$2,088	N/A	N/A	\$105,031
>500 emp.	\$2,727	\$0	\$0	\$0	\$0	N/A	N/A	\$2,727
First Year Reductions	\$90,596	\$26,861	\$267	#####	\$2,088	N/A	N/A	\$122,227
Adjusted First Year Costs Annualized								
Mine Size	Annual Cost Reductions ^b	Adjusted Total First Year Cost Reductions ^c	Adjusted First Year Cost Reductions Annualized ^d					
<20 emp.	\$29,522	-\$15,053	-\$1,054					
≥20 emp. ≤500	\$209,658	-\$104,627	-\$7,324					
>500 emp.	\$5,454	-\$2,727	-\$191					
Penalty Reductions	\$244,634	-\$122,407	-\$8,568					

^a Penalty costs derived by multiplying dollars in Tables IV-14 by citations in Table IV-65.

^b An amount equivalent to annual cost reductions from Table IV-80.

^c Adjusted first year cost reductions equal first year cost reductions minus annual cost reductions.

^d Adjusted total first year cost reductions annualized equals adjusted first year cost reductions times 0.07, where 0.07 is the annualization factor.

**Table IV-80: Annual Penalty Cost Reductions
Related to the Reduced Number of Citations Issued
Based on MSHA Inspector Sample Results**

Penalty Compliance Cost Reductions ^a								
Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Annual Penalty Cost Reductions
Underground Coal Mines								
<20 emp.	\$19,425	\$9,338	\$0	\$63	\$696	N/A	N/A	\$29,522
≥20 emp. ≤ 500	\$156,138	\$44,676	\$534	#####	\$3,480	N/A	N/A	\$209,658
>500 emp.	\$5,454	\$0	\$0	\$0	\$0	N/A	N/A	\$5,454
Penalty Reductions	\$181,017	\$54,014	\$534	#####	\$4,176	N/A	N/A	\$244,634

^a Penalty costs derived by multiplying dollars in Tables IV-14 by citations in Table IV-66.

Summary of Cost Reductions Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

Table IV-81 presents, by mine size category, a summary of the cost reductions that have been discussed above. These cost reductions relate to the reduced number of citations issued based on MSHA inspector sample results. The reduced citations are the result of two factors. First, the implementation of the proposed PV rule will result in improved ventilation plans, which in turn will lead to fewer citations being issued for overexposures. Second, with the elimination of operator sampling, all abatement sampling related to citations issued based on MSHA inspector sample results would now be performed by MSHA instead of by the operator.

Table IV-82 presents, by mine size category, a summary of the penalty cost reductions that would result from the reduced number of citations issued based on MSHA inspector sample results.⁴⁶

⁴⁶ As previously noted, penalty costs conventionally are not considered to be a cost of a rule (and, in fact, are clearly not a compliance cost) but merely a transfer payment from a party violating a rule to the government. The same applies to savings from a reduction in penalty costs.

Table IV-81: Summary of Cost Reductions for Underground Coal Mines Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results *

Estimated Cost Reductions	<20 emp.				>20 emp. <500				>500				Total			
	Adj. First Year Savings	Annual-ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual-ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual-ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual-ized Savings	Annual Savings	Total Yearly Savings
Corrective Actions	-\$234,050	-\$16,383	\$470,146	\$453,762	-\$746,183	-\$52,233	\$1,484,963	\$1,432,730	-\$33,584	-\$2,351	\$67,167	\$64,816	-\$1,013,817	-\$70,967	\$2,022,276	\$1,951,308
Abat. Sampling	\$0	\$0	\$61,209	\$61,209	\$0	\$0	\$163,067	\$163,067	\$0	\$0	\$3,765	\$3,765	\$0	\$0	\$228,041	\$228,041
Dust Cards	\$0	\$0	\$1,135	\$1,135	\$0	\$0	\$3,284	\$3,284	\$0	\$0	\$124	\$124	\$0	\$0	\$4,544	\$4,544
Send Samples	\$0	\$0	\$1,899	\$1,899	\$0	\$0	\$5,495	\$5,495	\$0	\$0	\$208	\$208	\$0	\$0	\$7,603	\$7,603
Post Results	-\$173	-\$12.08	\$171	\$158	-\$493	-\$35	\$493	\$459	-\$19	-\$1	\$36	\$35	-\$685	-\$48	\$700	\$652
Write Dust Plan	-\$149	-\$10.46	\$149	\$139	-\$299	-\$21	\$747	\$726	\$0	\$0	\$0	\$0	-\$448	-\$31	\$896	\$865
Post/Give Plan	-\$3	-\$0.18	\$3	\$2	-\$5	\$0	\$13	\$13	\$0	\$0	\$0	\$0	-\$8	-\$1	\$16	\$15
Total	-\$234,374	-\$16,406	\$534,712	\$518,305	-\$746,981	-\$52,289	\$1,658,063	\$1,605,775	-\$33,603	-\$2,352	\$71,301	\$68,949	-\$1,014,958	-\$71,047	\$2,264,076	\$2,193,029

* Source: Table IV-64 through Table IV-78.

^a The adjusted first year cost reductions include some operating, maintenance, and replacement (OM&R) cost reductions that are associated with the first year installation cost reductions, but are not incurred until later years. When these later year OM&R cost reductions are subtracted out, the adjusted first year cost reductions born by underground coal mines to comply with the PV rule would be -\$274,872 rather than -\$1,014,958. The adjusted first year cost reductions by mine size, after subtracting out the later-year OM&R cost reductions, would be -\$63,518 for mines with fewer than 20 workers, -\$202,267 for mines with 20 to 500 workers, and -\$9,087 for mines with more than 500 workers. Total first year cost reductions, including annual cost reductions, accruing to underground coal mines to comply with the PV rule would therefore be \$1,989,204 (\$471,194 for mines with fewer than 20 workers, \$1,455,796 for mines with 20 to 500 workers, and \$62,214 for mines with more than 500 workers).

Table IV-82: Summary of Penalty Charge Reductions for Underground Coal Mines Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results *

Estimated Costs Reductions	<20 emp.				>20 emp. <500				>500				Total			
	Adj. First Year Savings	Annual- ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual- ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual- ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual- ized Savings	Annual Savings	Total Yearly Savings
Ug. Coal Mines	-\$15,053	-\$1,054	\$29,522	\$28,468	-\$104,627	-\$7,324	\$209,658	\$202,334	-\$2,727	-\$191	\$5,454	\$5,263	-\$122,407	-\$8,568	\$244,634	\$236,066

* Source: Table IV-79 and Table IV-80.

The first year costs are \$122,227, of which \$14,469 are related to mines employing fewer than 20 workers, \$105,031 are related to mines employing between 20 and 500 workers, and \$2,727 are related to mines that employ more than 500 workers.

PART 2 - COST REDUCTIONS RELATED TO THE REDUCED NUMBER OF CITATIONS ISSUED BASED ON OPERATOR BI-MONTHLY SAMPLE RESULTS

In addition to a reduction in the number of citations issued based on MSHA inspector sample results, the PV rule will also cause a decrease in the number of citations issued based on operator bi-monthly sample results.⁴⁷ The reason for this reduction is that the proposed PV rule would induce operators to improve their mine ventilation plans, which would result in fewer citations issued for overexposures. As is the case with citations based on inspector sampling, MSHA assumes that 90 percent of citations issued based on operator bi-monthly sample results would be eliminated as a result of the improved ventilation plans.

MSHA used the following technique to estimate the reduced number of annual citations issued based on operator bi-monthly sample results. The reduction in MMU and RB-DA citations was derived by reducing the operator bi-monthly MMU and RB-DA citations that occurred over a 12 month period (7/1/98 - 6/30/99) by 90 percent. In order to arrive at the reduced number of I-DA, O-DA, and P-90 citations, MSHA took the small number of I-DA, O-DA, and P-90 MSHA inspector citations resulting from a single, full-shift sample, noted in Table IV-2, and also reduced those numbers by 90 percent.

⁴⁷ Note that the proposed PV rule would eliminate bi-monthly sampling. However, MSHA would take over this responsibility under the proposed rule.

In addition, currently, if results from samples taken by operators showed an overexposure, then the mine operator would perform the abatement sampling related to the overexposure. However, with the elimination of bi-monthly operator sampling, not only the bi-monthly sampling, but also all related abatement sampling, would be performed by MSHA inspectors instead of the mine operators. Therefore, there are certain operator costs that would not occur because the act of performing abatement sampling, in this case, would have been shifted from mine operators to MSHA inspectors.

Concerning operator cost reductions related to citations issued based on operator bi-monthly sample results, MSHA assumes the following:

Annually, beginning in the first year that the proposed PV rule is effective, costs related to 100 percent of the citations would be eliminated in the following areas: abatement sampling; completing dust data cards; and sending samples and dust cards to MSHA. This is because, with the elimination of bi-monthly sampling by operators these costs would no longer arise for them.

For every year after the first year that the proposed PV rule is in effect, costs related to 90 percent of the citations issued based on operators bi-monthly sample results would be eliminated in the following areas: corrective actions; posting sampling results; writing dust plans; and posting or giving dust plans to the appropriate parties.⁴⁸ The first year the proposed PV rule is in effect would be a "transition" year during which ventilation plans will be verified. For that reason, the PV rule would only be half as effective in eliminating citations the first year

⁴⁸ The first year the proposed PV rule is in effect would be a "transition" year during which ventilation plans will be verified. For that reason, the PV rule would only be half as effective in eliminating citations the first year as in later years. Therefore, the cost reduction the first year would only be 40 percent in these areas.

as in later years. Therefore, the cost reduction the first year would only be 45 percent in these areas.

The above percentages were obtained from discussions with technical staff in MSHA's Coal Mine and Health Division. MSHA requests comments and any available data concerning the percentage reduction in citations that would be expected as a result of the implementation of the proposed PV rule.

Table IV-83 shows, by mine size and type, MSHA's estimate of the number of annual citations issued based on operators bi-monthly sample results. Table IV-84 shows, by mine size and type, a 45 percent reduction in the citations noted in Table IV-83, expected in the first year that the PV rule is in effect. Table IV-85 shows, by mine size and type, a 90 percent reduction in the citations noted in Table IV-83, expected annually after the first year that the PV rule is in effect.

Table IV-83:
Annual Number of Citations
Issued Based on Operator Bi-Monthly Sample Results (*)
(100% of Citations)

Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	39	48	0	1	1	N/A	N/A	89
≥20 emp. ≤500	268	163	0	14	2	N/A	N/A	447
>500 emp.	19	0	0	0	0	N/A	N/A	19
Ug. Total	326	211	0	15	3	N/A	N/A	555

(*) The PV rule would not affect DWP and NDWP citations in underground coal mines or citations at surface coal mines.

Table IV-84:
First Year Reduction in the Number of Citations
Issued Based on Operator Bi-Monthly Sample Results (*)
(45% of Citations)

Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	18	22	0	0	0	N/A	N/A	40
≥20 emp. ≤500	121	73	0	6	1	N/A	N/A	201
>500 emp.	8	0	0	0	0	N/A	N/A	8
Ug. Total	147	95	0	6	1	N/A	N/A	249

(*) The PV rule would not affect DWP and NDWP citations in underground coal mines or citations at surface coal mines.

Table IV-85:
Annual Reduction in the Number of Citations
Issued Based on Operator Bi-Monthly Sample Results (*)
(90% of Citations)

Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Total
Underground Coal Mines								
<20 emp.	35	43	0	1	1	N/A	N/A	80
≥20 emp. ≤500	241	147	0	12	2	N/A	N/A	402
>500 emp.	17	0	0	0	0	N/A	N/A	17
Ug. Total	293	190	0	13	3	N/A	N/A	499

(*) The annual 90 percent reduction starts in the second year after the proposed PV rule takes effect. The PV rule would not affect DWP and NDWP citations in underground coal mines or citations at surface coal mines.

Table IV-86 shows bi-monthly operator citations by mine size category and by non-longwall and longwall categories.

Table IV-86:
Annual Citations Issued Based on
Operator Bi-Monthly Sample Results
by Mine Size Category
and Non-longwall and Longwall Category

Mine Size	100% of Citations	45% of Citations in First Year of PV Rule	90% of Citations in First Year of PV Rule
Underground Coal Mines			
<20 emp.	89	40	80
≥20 emp. ≤500 no lgwl	406	182	365
≥20 emp. ≤500 lgwl	41	19	37
Sub-Total	447	201	402
>500 emp. no lgwl	9	4	8
>500 emp. lgwl	10	4	9
Sub-total	19	8	17
Total Annual Ug. Citations	555	249	499

The 100 percent of citations noted in Table IV-86 will be used to derive cost reductions related to abatement sampling, completing dust data cards, and sending samples and dust cards to MSHA.

The 45 percent and 90 percent of citations noted in Table IV-86 will be used to derive cost reductions for corrective actions, posting sampling results, writing dust plans, and

posting or giving dust plans to the appropriate parties.

Annual Corrective Action Cost Reductions Related to the
Reduced Number of Citations Issued Based on Operator
Bi-Monthly Sample Results

To calculate the corrective action cost savings due to the reduction in the number of citations issued based on operator bi-monthly sample results, MSHA used the same corrective action cost figures that were derived earlier when calculating the corrective action compliance costs associated with an SFSS citation. As determined earlier, for underground mines, the corrective action costs were \$1,519 for an MMU or RB-DA citation in a non-longwall mine, and \$2,056 for an MMU or RB-DA citation in a longwall mine. For all other types of citations issued in underground coal mines, costs for the corrective actions were estimated to be \$200 per citation in mines that employ fewer than 20 workers and \$400 per citation in mines that employ 20 or more workers. These corrective actions would also generate an associated stream of annual operating, maintenance, and replacement (OM&R) costs. MSHA estimates that these OM&R costs each year would be equal to approximately 25 percent of the original installation costs.

Furthermore, as MSHA previously assumed, corrective actions unique to this rule would have been taken for only 40 percent of the citations issued to non-longwall underground mines and

60 percent of the citations issued to underground longwall operators. These same percentages would apply to the operator savings from a reduction in citations issued based on operator bi-monthly sample results.

Table IV-87 shows the mine operators' first year corrective action cost decrease related to a 45 percent reduction in the number of citations issued based on operator bi-monthly sample results.⁴⁹

Table IV-88 shows the mine operators' annual corrective action cost decrease (including an equivalent amount for the first year as derived in the previous table) related to a 90 percent reduction in the number of citations issued based on operator bi-monthly sample results.

⁴⁹ Note that the adjusted first year cost reduction is a negative number. This is because, even though the first year cost reduction is positive, it is less than the annual reduction in each subsequent year. Therefore a negative adjustment is required.

Table IV-87: Total First Year and Annualized Corrective Action Cost Reductions Related to the Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results

(Mine size)	Reduced No. of MMU & RB-DA Citations ^a	Reduced No. of I-DA, O-DA & P-90 Citations ^a	MMU & RB-DA Corrective Action Costs (per Citation) ^b	I-DA, O-DA, & P-90 Citations Corrective Action Costs (per Citation) ^c	First Year Cost Reduction ^d
Underground Mines					
<20 emp.	16	0	\$6,944	\$914	\$111,104
≥20 emp. ≤500 no lgwl	70.4	2.4	\$6,944	\$1,829	\$493,246
≥20 emp. ≤500 lgwl	10.8	0.6	\$9,399	\$1,829	\$102,605
Sub-total	81.2	3			\$595,851
>500 emp. no lgwl	1.6	0	\$6,944	\$0	\$11,110
>500 emp. lgwl	2.4	0	\$9,399	\$0	\$22,557
Sub-total	4.0	0			\$33,668
First Year Cost Reductions					\$740,623
Adjusted First Year Cost Reductions Annualized					
Mine size		First Year Cost Reductions	Annual Cost Reductions ^e	Adjusted Total First Year Cost Reductions ^f	Adjusted First Year Cost Reductions Annualized ^g
<20 emp.		\$111,104	\$217,384	-\$106,280	-\$7,440
≥20 emp. ≤500 no lgwl		\$493,246	\$987,224	-\$493,978	-\$34,578
≥20 emp. ≤500 lgwl		\$102,605	\$204,112	-\$101,508	-\$7,106
Sub-total		\$595,851	\$1,191,336	-\$595,485	-\$41,684
>500 emp. no lgwl		\$11,110	\$22,221	-\$11,110	-\$778
>500 emp. lgwl		\$22,557	\$50,754	-\$28,197	-\$1,974
Sub-total		\$33,668	\$72,975	-\$39,307	-\$2,751
Cost Reductions		\$740,623	\$1,481,695	-\$741,072	-\$51,875

^a With respect to the 45 percent reduction in citations (from Table IV-86), we assume that 40 percent of citations in non-longwall mines would involve corrective actions and 60 percent of citations in longwall mines would involve corrective actions. The relative share of MMU & RB-DA citations to I-DA, O-DA, and P-90 citations was derived from Table IV-84.

^b For non-longwall MMUs & RB-DAs \$6,944 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$1,519 = $(0.50 \times \$525) + (0.75 \times \$1,275) + (0.50 \times \$600)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For longwall MMUs & RB-DAs \$9,399 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective of action \$2,056 = $(0.20 \times \$750) + (0.25 \times \$1,525) + (1 \times \$1,525)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^c For other citations in ug. non-longwall mines employing fewer than 20 workers
\$914 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$200; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For other citations in ug. longwall mines and surface mines employing 20 to 500 workers:
\$1,829 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$400; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^d Cost formula = (no. of reduced MMU & RB-DA citations x MMU & RB-DA correction action costs) + (no. of reduced I-DA, O-DA & P-90 citations x I-DA, O-DA, & P-90 corrective action costs).

^e An amount equivalent to annual cost reductions from Table IV-88

^f Adjusted first year cost reductions equal first year cost reductions minus annual cost reductions

^g Adjusted total first year cost reductions annualized equals adjusted first year cost reduction times 0.07, where 0.07 is the annualization factor.

Table IV-88: Annual Corrective Action Cost Reductions Related to the Reduced Number of Citations Issued Based on Operators Bi-Monthly Sample Results

(Mine size)	Reduced No. of MMU & RB-DA Citations ^a	Reduced No. of I-DA, O-DA & P-90 Citations ^a	MMU & RB-DA Corrective Action Cost Reductions (per Citation) ^b	I-DA, O-DA, & P-90 Citations Corrective Action Cost Reductions (per Citation) ^c	Annual Cost Reduction ^d
Underground Mines					
<20 emp.	31.2	0.8	\$6,944	\$914	\$217,384
≥20 emp. ≤500 no lgwl	140.8	5.2	\$6,944	\$1,829	\$987,224
≥20 emp. ≤500 lgwl	21.6	0.6	\$9,399	\$1,829	\$204,112
Sub-total	162.4	5.8			\$1,191,336
>500 emp. no lgwl	3.2	0	\$6,944	\$0	\$22,221
>500 emp. lgwl	5.4	0	\$9,399	\$0	\$50,754
Sub-total	8.6	0			\$72,975
Annual Cost Reductions					\$1,481,695

^a With respect to the 45 percent reduction in citations (from Table IV-86), we assume that 40 percent of citations in non-longwall mines would involve corrective actions and 60 percent of citations in longwall mines would involve corrective actions. The relative share of MMU & RB-DA citations to I-DA, O-DA, and P-90 citations was derived from Table IV-85.

^b For non-longwall MMUs & RB-DAs \$6,944 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$1,519 = $(0.50 \times \$525) + (0.75 \times \$1,275) + (0.50 \times \$600)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For longwall MMUs & RB-DAs \$9,399 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective of action \$2,056 = $(0.20 \times \$750) + (0.25 \times \$1,525) + (1 \times \$1,525)$; and where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^c For other citations in ug. non-longwall mines employing fewer than 20 workers:
\$914 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$200; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.
For other citations in ug. longwall mines and surface mines employing 20 to 500 workers:
\$1,829 = first year cost of Y, where $Y = P + (0.25 \times P)/0.07$. P = average cost of first year corrective action of \$400; where $(0.25 \times P)/0.07$ = discounted present value of a stream of annual OM&R costs.

^d Cost formula = (no. of reduced MMU & RB-DA citations x MMU & RB-DA correction action costs) + (no. of reduced I-DA, O-DA & P-90 citations x I-DA, O-DA, & P-90 corrective action costs).

Existing §§ 70.201(d) & 90.201(d)
Annual Abatement Sampling Cost Reductions Related to the
Reduced Citations Issued Based on Operator Bi-Monthly Sample
Results

As noted earlier, in order to abate an MSHA inspector citation, the mine operator must take abatement samples after corrective actions are taken. However, with the elimination of bi-monthly sampling by operators, all sampling responsibility for operators are eliminated, which includes abatement sampling for citations issued based on operator bi-monthly sample results. Therefore, beginning in the first year and continuing annually, operators would realize a cost reduction for no longer having to perform abatement sampling related to all of the citation noted in Table IV-83.

Currently, the operator takes a set of 5 abatement samples for each citation received, one per consecutive production shift or production day. For purposes of estimating the abatement sampling, MSHA assumes that operators would be able to come back into compliance after their first set of 5 abatement samples. A second set of 5 abatement samples would not be needed.

As noted earlier, abatement sampling costs are not the same for all coal mine operators. Some operators perform their own sampling with their own sampling equipment. Other operators perform their own sampling but do not own any sampling equipment and thus must rent the equipment. Finally, some operators shift their sampling responsibilities to contractors who perform the

sampling with their (the contractors') own equipment. Table IV-7 provides an estimate of the breakdown of underground and surface coal mine operators by the way they sample.

The sampling rates in Table IV-8, which were derived by utilizing the three different sampling methods in Table IV-7, are used in Table IV-89 to determine mine operators' annual abatement sampling cost reduction for all (100 percent) of the citations issued based on operator bi-monthly sample results.

Table IV-89: Existing 70.201(d) & 90.201(d)

Total Annual Abatement Sampling Cost Reductions Related to the Reduced Citations Issued Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced No. of Citations ^a	No. of Samples Per Citation	Cost Per Sample ^b	Total Annual Cost Reductions
Underground Coal Mines				
<20 emp.	89	5	\$64.43	\$28,671
≥20 emp. ≤500 no lgwl	406	5	\$62.59	\$127,049
≥20 emp. ≤500 lgwl	41	5	\$37.65	\$7,718
Sub-Total	447			\$134,767
>500 emp. no lgwl	9	5	\$37.65	\$1,694
>500 emp. lgwl	10	5	\$37.65	\$1,882
Sub-Total	19			\$3,577
Annual Cost Reductions				\$167,015

^a A reduced number of citations from Table IV-86.

^b \$64.43 = (0.63 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter))+
(0.33 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+75 equip.))+
(0.04 x \$200).

\$62.59 = (0.66 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter))+
(0.30 x ((0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$75 equip.))+
(0.04 x \$200).

\$37.65 = (0.8333 hr. x \$19 wage) +(0.1666 hr. x \$49.79 wage)+\$13.52 filter.

Existing §§ 70.209(c) & 90.209(c)
Annual Abatement Sampling Dust Data Cards Cost Reductions
Related to the Reduced Citations Issued Based on Operator
Bi-Monthly Sample Results

After each abatement sample is taken, a dust data card must be filled out. The card is provided by the manufacturer when the mine operator purchases a filter cassette. After the information is recorded on the card, a certified person signs it and writes his certification number on the card. MSHA estimates that after each sample it would take 0.025 hours (about 1.5 minutes) for a mine safety inspector, or equivalent person, to complete and sign the dust data card. The mine safety inspector hourly wage rate is similar to a mine supervisor's wage rate of \$49.79. For the eliminated abatement sampling, the above costs would be prevented.

Table IV-90 shows operators' annual cost reduction associated with dust data cards for abatement samples due to the elimination of all of the citations issued based on operator bi-monthly sample results. The dust data cards cost reductions shown in Table IV-90 are adjusted to reflect the different methods of sampling. For instance, there are no cost reductions related to dust data cards for operators who contract out sampling.

Table IV-90: Existing 70.209(c) & 90.209(c)
Total Annual Cost Reductions for Completing Dust Cards for Abatement
Samples Related to Reduced Citations Issued Based on Operator
Bi-Monthly Sample Results

Mine Size	Reduced No. of Citations ^a	No. of Samples Per Citation	Cost for Dust Data Card ^b	Total Annual Cost Reductions
Underground Coal Mines				
<20 emp.	89	5	\$1.19	\$532
≥20 emp. ≤500 no lgwl	406	5	\$1.19	\$2,426
≥20 emp. ≤500 lgwl	41	5	\$1.24	\$255
Sub-Total	447			\$2,681
>500 emp. no lgwl	9	5	\$1.24	\$56
>500 emp. lgwl	10	5	\$1.24	\$62
Sub-Total	19			\$118
Annual Cost Reductions				\$3,331

^a A Reduced number of citations from Table IV-86.

^b Ug. mines <20 emp:

$$\$1.19 = (0.63 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.33 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.04 \times \$0).$$

Ug. non-longwall mines ≥20 emp. ≤500:

$$\$1.19 = (0.66 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.30 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})) + (0.04 \times \$0).$$

$$\$1.24 = (1 \times (0.025 \text{ hr.} \times \$49.79 \text{ wage})).$$

Existing §§ 70.209(a) & 90.209(a)
Annual Cost Reductions to Send Abatement Samples and Dust
Cards to MSHA Related to Reduced Citations Issued Based on
Operator Bi-Monthly Sample Results

Each abatement sample along with its dust data card is sent by mine operators who perform their own sampling to an MSHA laboratory for analysis. For mine operators who contract out their sampling, the samples and dust data cards are sent to MSHA by the contractor who does the sampling. MSHA estimates that it takes a certified dust technician about 0.0833 hours (or 5 minutes) to prepare and send in one sample along with any relevant data to MSHA. The cost of postage to send in 1 sample is estimated to be about \$0.50. For the eliminated abatement sampling, the above costs would be prevented.

Table IV-91 shows operators' annual cost reduction associated with sending to MSHA for analysis the abatement samples and dust data cards due to the elimination of all of the citations issued based on operator bi-monthly sample results.

Table IV-91: Existing 70.209(a) & 90.209(a)

Total Annual Cost Reductions to Send to MSHA Abatement Samples and Dust Cards Related to Reduced Citations Issued Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced No. of Citations ^a	No. of Samples Per Citation	Cost to Send Sample and Dust Card to MSHA ^b	Total Annual Cost Reductions
Underground Coal Mines				
<20 emp.	89	5	\$2.00	\$890
≥20 emp. ≤500 no lgwl	406	5	\$2.00	\$4,059
≥20 emp. ≤500 lgwl	41	5	\$2.08	\$427
Sub-Total	447			\$4,486
>500 emp. no lgwl	9	5	\$2.08	\$94
>500 emp. lgwl	10	5	\$2.08	\$104
Sub-Total	19			\$198
Annual Cost Reductions				\$5,573

^a A reduced number of citations from Table IV-86.

^b For ug. mines that employ fewer than 20 workers \$2.00 =
 $(0.63 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)) + (0.33 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50))$.

For ug. non-longwall mines that employ between 20 and 500 workers \$2.00 =
 $(0.66 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)) + (0.30 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50))$.

\$2.08 = $1 \times ((0.0833 \text{ hr.} \times \$19 \text{ wage}) + \$0.50)$.

Existing §§ 70.210(b) & 90.210(b)
Annual Cost Reductions to Post Abatement Sample Results
Related to Reduced Citations Issued Based on Operator
Bi-Monthly Sample Results

After MSHA has analyzed the abatement samples, the Agency sends the sample results back to the mine operator. Upon receiving the sample results, the mine operator must post them on the mine bulletin board. For costing purposes, it is assumed that the 5 abatement sample results are sent back to the mine operator on one page. Thus, for each citation, one page worth of sample results needs to be posted. MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and post the results. Photocopying costs per page are estimated to be \$0.15. For the eliminated citations, the above costs would be prevented.

With respect to part 90 citations, existing § 90.210(b) states that the mine operator does not have to post the sample results but rather must give a copy to the miner. MSHA assumes that it would take the same amount of time to copy and give the results to the miner as it would to copy and post the results.

Table IV-92 shows operators' first year and annualized cost decrease associated with posting sample results related to the 45 percent reduction in the number of citations issued based on operator bi-monthly sample results.⁵⁰

⁵⁰ Note that the adjusted first year cost reduction is a negative number. This is because, even though the first year cost reduction is positive, it is less than the annual cost reduction in each subsequent year. Therefore, a negative adjustment is required.

Table IV-93 shows operators' annual cost decrease associated with posting sample results (including an equivalent amount for the first year as derived in the previous table) that is related to the 90 percent reduction in the number of citations issued based on operator bi-monthly sample results.

Table IV-92: Existing 70.210(b) & 90.210(b)
First Year and Annualized Cost Reductions to Post Abatement Sample
Results Related to Reduced Citations Issued Based on Operator
Bi-Monthly Sample Results

Mine Size	Reduced No. of Citations ^a	Cost to Post Sample Results Per Citation ^b	First Year Cost Reductions
Underground Coal Mines			
<20 emp.	40	\$2.01	\$80
≥20 emp. ≤500 no lgwl	182	\$2.01	\$365
≥20 emp. ≤500 lgwl	19	\$2.01	\$38
Sub-Total	201		\$403
>500 emp. no lgwl	4	\$2.01	\$8
>500 emp. lgwl	4	\$2.01	\$8
Sub-Total	8		\$16
First Year Reductions			\$499
Adjusted First Year Costs Annualized			
Mine Size	Annual Costsb Reductions ^c	Adjusted Total First Year Cost Reductions ^d	Adjusted First Year Cost Reductions Annualized ^e
<20 emp.	\$160	-\$80	-\$5.62
≥20 emp. ≤500 no lgwl	\$732	-\$367	-\$25.70
≥20 emp. ≤500 lgwl	\$74	-\$36	-\$2.53
Sub-Total	\$806	-\$403	-\$28
>500 emp. no lgwl	\$16	-\$8	-\$0.56
>500 emp. lgwl	\$18	-\$10	-\$0.70
Sub-Total	\$34	-\$18	-\$1
Cost Reductions	\$1,001	-\$502	-\$35

^a A reduced number of citations from Table IV-86.

^b \$2.01 = (0.1 hr. x \$18.56)+(1 pg. x \$0.15).

^c An amount equivalent to annual cost reductions from Table IV-93.

^d Adjusted first year cost reductions equal first year cost reductions
minus annual cost reductions.

^e Adjusted total first year cost reductions annualized equals adjusted first year
cost reductions times 0.07, where 0.07 is the annualization factor.

Table IV-93: Existing 70.210(b) & 90.210(b)
Annual Cost Reductions to Post Abatement Sample Results
Related to Reduced Citations Issued Based on operator
Bi-Monthly Sample Results

Mine Size	Reduced No. of Citations ^a	Cost to Post Sample Results Per Citation ^b	Annual Cost Reductions
Underground Coal Mines			
<20 emp.	80	\$2.01	\$160
≥20 emp. ≤500 no lgwl	365	\$2.01	\$732
≥20 emp. ≤500 lgwl	37	\$2.01	\$74
Sub-Total	402		\$806
>500 emp. no lgwl	8	\$2.01	\$16
>500 emp. lgwl	9	\$2.01	\$18
Sub-Total	17		\$34
Annual Cost Reductions			\$1,001

^a A reduced number of citations from Table IV-86.

^b \$2.01 = (0.1 hr. x \$18.56)+(1 pg. x \$0.15).

Existing § 90.300(a)
Annual Cost Reductions to Submit Plan Related to Reduced
Number of Citations Issued Based on Operator Bi-Monthly
Sample Results

An operator must write and submit to MSHA a respirable dust control plan after a part 90 citation has been abated. Under § 90.300(a), the mine operator must submit a written plan for that part 90 miner involved in the citation. MSHA estimates that it would take a mine supervisor an average of 3 hours to write a plan. For the eliminated citations, the above costs would be prevented.

Table IV-94 shows the operators' first year and annualized cost decrease associated with writing a respirable dust control plan related to the 45 percent reduction in the number of Part 90 citations (1 citation in a mine that employ between 20 to 500 workers) issued based on operators bi-monthly sample results.⁵¹

Table IV-95 shows operators' annual cost decrease associated with writing a respirable dust control plan (including an equivalent amount for the first year as derived in the previous table) that is related to the 90 percent reduction in the number of Part 90 citations (3 citations, 1 in mines that employ fewer than 20 workers, and 2 in mines that employ between 20 to 500 workers) issued based on operator bi-monthly sample results.

⁵¹ Note that the adjusted first year cost reduction is a negative number. This is because, even though the first year cost reduction is positive, it is less than the annual cost reduction in each subsequent year. Therefore, a negative adjustment is required.

Table IV-94: Existing 90.300(a)
First Year and Annualized Cost Reductions to Write Dust Control
Plan Related to Reduced Citations Issued Based on Operator
Bi-Monthly Sample Results

Mine Size	Reduced No. of Dust Plans to Write ^a	Cost to Write Dust Plans (Per Citation) ^b	First Year Cost Reductions
Underground Coal Mines			
<20 emp.	0	\$149.37	\$0
≥20 emp. ≤500 no lgwl	1	\$149.37	\$149
≥20 emp. ≤500 lgwl	0	\$149.37	\$0
Sub-Total	1		\$149
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
First Year Cost Reductions			\$149
Adjusted First Year Cost Reductions Annualized			
Mine Size	Annual Cost Reductions ^c	Adjusted Total First Year Cost Reductions ^d	Adjusted First Year Cost Reductions Annualized ^e
<20 emp.	\$149	-\$149	-\$10.46
≥20 emp. ≤500 no lgwl	\$149	\$0	\$0.00
≥20 emp. ≤500 lgwl	\$149	-\$149	-\$10.46
Sub-Total	\$299	-\$149	-\$10
>500 emp. no lgwl	\$0	\$0	\$0
>500 emp. lgwl	\$0	\$0	\$0
Sub-Total	\$0	\$0	\$0
Cost Reductions	\$448	-\$299	-\$21

^a A reduced number of dust plans to write from Table IV-84.

^b \$149.37 = 3 hours x \$49.79.

^c An amount equivalent to annual cost reductions from Table IV-95.

^d Adjusted first year cost reductions equal first year cost reductions minus annual cost reductions.

^e Adjusted total first year cost reductions annualized equals adjusted first year cost reductions times 0.07, where 0.07 is the annualization factor.

Table IV-95: Existing 90.300(a)

**Total Annual Cost Reductions to Write Dust Control Plan
Related to Reduced Citations Issued Based on Operator
Bi-Monthly Sample Results**

Mine Size	Reduced No. of Dust Plans to Write ^a	Cost to Write Dust Plans (Per Citation) ^b	Annual Cost Reductions
Underground Coal Mines			
<20 emp.	1	\$149.37	\$149
≥20 emp. ≤500 no lgwl	1	\$149.37	\$149
≥20 emp. ≤500 lgwl	1	\$149.37	\$149
Sub-Total	2		\$299
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
Annual Cost Reductions			\$448

^a A reduced number of dust plans to write from Table IV-85.

^b \$149.37 = 3 hours x \$49.79.

Existing § 90.301(d)

Annual Cost Reductions to Provide Copy of Dust Plan Related to the Reduced Citations Issued Based on Operator Bi-Monthly Sample Results

Once mine operators have an approved respirable dust control plan, under § 90.301(d), the operator must provide a copy of the approved respirable dust control plan to the part 90 miner.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and provide the plan to the P-90 miner. On average, the plan is estimated to be about 5 pages. Photocopying costs per page are estimated to be \$0.15. For the reduced citations, the above costs would be prevented.

Table IV-96 shows operators' first year and annualized cost decrease associated copying the plan and giving it to a miner related to the 45 percent reduction in the number of Part 90 citations (1 citation in a mine that employ between 20 to 500 workers) issued based on operators bi-monthly sample results.⁵²

Table IV-97 shows operators' annual cost decrease associated with copying the plan and giving it to a miner (including an equivalent amount for the first year as derived in the previous table) that is related to the 90 percent reduction in the number of Part 90 citations (3 citations, 1 in mines that employ fewer than 20 workers, and 2 in mines that employ between 20 to

⁵² Note that the adjusted first year cost reduction is a negative number. This is because even though the first year cost reduction is positive, it is less than the annual cost reduction in each subsequent year. Therefore, a negative adjustment is required.

500 workers) issued based on operators bi-monthly sample results.

Table IV-96: Existing 90.301(d)
First Year and Annualized Cost Reductions to Provide Miner With
a Copy of the Dust Plan Related to Reduced Citations Issued
Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced No. of Dust Plans ^a	Cost to Post or Provide Dust Plans (Per Citation) ^b	First Year Cost Reductions
Underground Coal Mines			
<20 emp.	0	\$2.61	\$0
≥20 emp. ≤500 no lgwl	1	\$2.61	\$3
≥20 emp. ≤500 lgwl	0	\$2.61	\$0
Sub-Total	1		\$3
>500 emp. no lgwl	0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0
Sub-Total	0		\$0
First Year Reductions			\$3
Adjusted First Year Cost Reductions Annualized			
Mine Size	Annual Cost Reductions ^c	Adjusted Total First Year Cost Reductions ^d	Adjusted First Year Cost Reductions Annualized ^e
<20 emp.	\$3	-\$3	-\$0.18
≥20 emp. ≤500 no lgwl	\$3	\$0	\$0.00
≥20 emp. ≤500 lgwl	\$3	-\$3	-\$0.18
Sub-Total	\$5	-\$3	-\$0.18
>500 emp. no lgwl	\$0	\$0	\$0
>500 emp. lgwl	\$0	\$0	\$0
Sub-Total	\$0	\$0	\$0
Total Cost Reductions	\$8	-\$5	-\$0.36

^a A reduced number of dust plans to write from Table IV-84.

^b \$2.61 = (\$18.56 clerical wage rate x 0.1 hour) +
(\$0.15 copy costs x 5 pgs. per plan).

^c An amount equivalent to annual cost reductions from Table IV-97.

^d Adjusted first year cost reductions equal first year cost reductions
minus annual cost reductions.

^e Adjusted total first year cost reductions annualized equals adjusted first
year cost reductions times 0.07, where 0.07 is the annualization factor.

Table IV-97

Annual cost reductions

to post or provide miner with a copy of the dust plan
related to the reduced number of citations
issued based on operator bi-monthly sample results

Annual Penalty Cost Reductions Related to Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results

Once mine operators are given a citation, they are assessed a monetary penalty. Even if an operator successfully abates the citation with abatement samples, the operator must still pay the monetary penalty. The dollar amount of the penalty is not the same for every citation; its determination is based upon a set of criteria that is set forth in 30 CFR §100.3. Table IV-14, presented earlier, provides average penalties for each kind of citation.

Table IV-98 derives the first year and annualized penalty cost reductions for the 45 percent reduction in the number of citations issued based on operator bi-monthly sample results. Table IV-98 uses average costs per penalty from Table IV-14 and the citations from Table IV-84 to derive the penalty cost reductions.

Table IV-99 derives the annual penalty cost reductions for the 90 percent reduction in the number of citations issued based on operator bi-monthly sample results. Table IV-99 uses average costs per penalty from Table IV-14 and the citations from Table IV-85 to derive the annual penalty cost reductions.

Table IV-98: First Year and Annualized Penalty Cost Reductions Related to Reduced Citations Issued Based on Operator Bi-Monthly Sample Results

Penalty Compliance Cost Reductions ^a								
Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	First Year Penalty Reductions
Underground Coal Mines								
<20 emp.	\$3,150	\$3,542	\$0	\$0	\$0	N/A	N/A	\$6,692
≥20 emp. ≤ 500	\$59,411	\$21,316	\$0	#####	\$696	N/A	N/A	\$83,493
>500 emp.	\$2,424	\$0	\$0	\$0	\$0	N/A	N/A	\$2,424
First Year Reductions	\$64,985	\$24,858	\$0	#####	\$696	N/A	N/A	\$92,609
Adjusted First Year Penalty Cost Reductions Annualized								
Mine Size	Annual Costs Reductions ^b	Adjusted Total First Year Cost Reductions ^c	Adjusted First Year Cost Reductions Annualized ^d					
<20 emp.	\$13,807	-\$7,115	-\$498					
≥20 emp. ≤500	\$166,787	-\$83,294	-\$5,831					
>500 emp.	\$5,151	-\$2,727	-\$191					
Penalty Cost Reductions	\$185,745	-\$93,136	-\$6,520					

^a Penalty cost reductions derived by multiplying dollars in Tables IV-14 by citations in Table IV-84.

^b An amount equivalent to annual cost reductions from Table IV-99.

^c Adjusted first year cost reductions equal first year cost reductions minus annual cost reductions.

^d Adjusted total first year cost reductions annualized equals adjusted first year cost reductions times 0.07, where 0.07 is the annualization factor.

Table IV-99: Annual Penalty Cost Reductions Related to Reduced Citations Issued Based on Operator Bi-Monthly Sample Results

Penalty Compliance Cost Reductions ^a								
Mine Size	MMU	RB DA	Intake DA	Outby DA	P-90	DWP	NDWP	Annual Penalty Reductions
Underground Coal Mines								
<20 emp.	\$6,125	\$6,923	\$0	\$63	\$696	N/A	N/A	\$13,807
≥20 emp. ≤ 500	\$118,331	\$42,924	\$0	#####	\$1,392	N/A	N/A	\$166,787
>500 emp.	\$5,151	\$0	\$0	\$0	\$0	N/A	N/A	\$5,151
Annual Reductions	\$129,607	\$49,847	\$0	#####	\$2,088	N/A	N/A	\$185,745

^a Penalty cost reductions derived by multiplying dollars in Tables IV-14 by citations in Table IV-85.

Summary of Cost Reductions Related to Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results

Table IV-100 presents, by mine size category, a summary of the cost reductions that have been discussed above. These cost reductions relate to the reduced number of citations issued based on operator bi-monthly sample results. The reduced citations are the result of two factors. First, the implementation of the proposed PV rule will result in improved ventilation plans, which in turn will lead to fewer citations being issued for overexposures. Second, with the elimination of operator sampling, all abatement sampling related to citations issued based on operators bi-monthly sample results would now be performed by MSHA instead of by the operator.

Table IV-101 presents, by mine size category, a summary of the penalty cost reductions that would result from the reduced number of citations issued based on operators bi-monthly sample results.⁵³

⁵³ As previously noted, penalty costs conventionally are not considered to be a cost of a rule (and, in fact, are clearly not a compliance cost) but merely a transfer payment from a party violating a rule to the government. The same applies to savings from a reduction in penalty costs.

Table IV-100: Summary of Cost Reductions Related to the Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results *

Estimated Costs	<20 emp.				>20 emp. <500				>500				Total			
	Adj. First Year Savings	Annual-ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual-ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual-ized Savings	Annual Savings	Yearly Savings	Adj. First Year Savings	Annual-ized Savings	Annual Savings	Total Yearly Savings
Corrective Actions	-\$106,280	-\$7,440	\$217,384	\$209,945	-\$595,485	-\$41,684	\$1,191,336	\$1,149,652	-\$39,307	-\$2,751	\$72,975	\$70,223	-\$741,072	-\$51,875	\$1,481,695	\$1,429,820
Abat. Sampling	\$0	\$0	\$28,671	\$28,671	\$0	\$0	\$134,767	\$134,767	\$0	\$0	\$3,577	\$3,577	\$0	\$0	\$167,015	\$167,015
Dust Cards	\$0	\$0	\$532	\$532	\$0	\$0	\$2,681	\$2,681	\$0	\$0	\$118	\$118	\$0	\$0	\$3,331	\$3,331
Send Samples	\$0	\$0	\$890	\$890	\$0	\$0	\$4,486	\$4,486	\$0	\$0	\$198	\$198	\$0	\$0	\$5,573	\$5,573
Post Results	-\$80	-\$5.62	\$160	\$155	-\$403	-\$28	\$806	\$778	-\$18	-\$1	\$34	\$33	-\$502	-\$35	\$1,001	\$966
Write Dust Plan	-\$149	-\$10.46	\$149	\$139	-\$149	-\$10	\$299	\$288	\$0	\$0	\$0	\$0	-\$299	-\$21	\$448	\$427
Post/Give Plan	-\$3	-\$0.18	\$3	\$2	-\$3	-\$0.18	\$5	\$5	\$0	\$0	\$0	\$0	-\$5	-\$0.36	\$8	\$7
Total	-\$106,512	-\$7,456	\$247,790	\$240,334	-\$596,040	-\$41,723	\$1,334,380	\$1,292,657	-\$39,325	-\$2,753	\$76,901	\$74,149	-\$741,878	-\$51,931	\$1,659,071	\$1,607,140

* Source: Table IV-83 through Table IV-99.

^a The adjusted first year cost reductions include some operating, maintenance, and replacement (OM&R) cost reductions that are associated with the first year installation costs, but are not incurred until later years. When these later year OM&R cost reductions are subtracted out, the adjusted first year cost reductions born by underground coal mines to comply with the PV rule would be -\$200,895 rather than -\$741,878. The adjusted first year costs by mine size, after subtracting out the later-year OM&R cost reductions, would be -\$28,928 for mines with fewer than 20 workers, -\$161,336 for mines with 20 to 500 workers, and -\$10,631 for mines with more than 500 workers. Total first year cost reductions, including annual cost reductions, accruing to underground coal mines to comply with the PV rule would therefore be \$1,458,176 (\$218,862 for mines with fewer than 20 workers, \$1,173,044 for mines with 20 to 500 workers, and \$66,270 for mines with more than 500 workers).

**Table IV-101: Summary of Penalty Charge Reductions Related to
Reduced Citations Issued Based on Operators Sample Results ***

Estimated Costs Reductions	<20 emp.				≥20 emp. <500				>500				Total			
	Adj. First	Annual-	Annual	Yearly	Adj. First	Annual-	Annual	Yearly	Adj. First	Annual-	Annual	Yearly	Adj. First	Annual-	Annual	Total
	Year	ized	Savings	Savings	Year	ized	Savings	Savings	Year	ized	Savings	Savings	Year	ized	Savings	Yearly
	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings	Savings
Ug. Coal Mines	-\$7,115	-\$498	\$13,807	\$13,309	-\$83,294	-\$5,831	\$166,787	\$160,956	-\$2,727	-\$191	\$5,151	\$4,960	-\$93,136	-\$6,520	\$185,745	\$179,225

* Source: Table IV-98 and Table IV-99.

The first year costs are \$83,656, of which \$6,020 are related to mines employing fewer than 20 workers, \$75,212 are related to mines employing between 20 and 500 workers, and \$2,424 are related to mines that employ more than 500 workers.

PART 2 - COST REDUCTIONS RELATED TO THE ELIMINATION OF OPERATOR BI-MONTHLY SAMPLING

We have already derived above the cost savings to mine operators for no longer having to take abatement samples when sample results show an overexposure. As previously noted, this is because MSHA inspectors would be performing all abatement sampling under the proposed PV rule. However, operators would also derive cost savings because they would no longer have to perform bi-monthly sampling to show that they are in compliance with MSHA's applicable respirable dust and silica standards. These costs savings are derived below.

Besides operators realizing cost savings from no longer have to sample every 2 months (or 6 times per year), saving would also be derived from not have to complete dust data cards and sending the samples and related dust cards to MSHA for analysis. Mine operators would still incur costs related to posting sample results: MSHA inspectors, instead of mine operators, would be performing the sampling, and MSHA would still send the sample results to the mine operators, who would be required to post such results under proposed § 70.220(a). In addition, the operator would still need to write and submit a dust plan and provide a copy of the plan to a part 90 miner after a part 90 citation has been abated.

Annual Sampling Cost Reductions Related to the Elimination of Operator Bi-Monthly Sampling

With respect to mine operators that employ fewer than 20 workers, MSHA estimates that, on average, each bi-monthly period mine operators take 5 samples per MMU and 1 DA sample per MMU. In addition, for each DA sample over the applicable dust standard, the operator takes 5 more DA samples. MSHA assumes that for all mine size categories 10 percent of all DA samples taken within a year will show an overexposure. Therefore, on average, on an annual basis (sampling 6 times per year), mines with fewer than 20 workers take 39 samples per MMU

$$[((5 \text{ samples}) + (1 \text{ DA sample}) + (1 \text{ DA sample} \times 0.10 \times 5)) \times 6 \text{ times per year}].$$

With respect to mine operators that employ 20 to 500 workers, MSHA estimates that, on average, each bi-monthly period mine operators take 5 samples per MMU and between 1 and 2 (an average of 1.5) DA samples per MMU. Therefore, on average, on an annual basis (sampling 6 times per year), mines that employ 20 to 500 workers take 43.5 samples per MMU

$$[((5 \text{ samples}) + (1.5 \text{ DA samples}) + (1.5 \text{ DA samples} \times 0.10 \times 5)) \times 6 \text{ times per year}].$$

With respect to mine operators that employ more than 500 workers, MSHA estimates that, on average, each bi-monthly period mine operators take 5 samples per MMU and 5 DA samples per MMU. Therefore, on average, on an annual basis (sampling 6 times

per year), mines that employ more than 500 workers take 75 samples per MMU $(((5 \text{ samples}) + (5 \text{ DA samples}) + (5 \text{ DA samples} \times 0.10 \times 5)) \times 6 \text{ times per year}]$.

The number of MMUs affected in each mine size category is the same as those used earlier in deriving verification sampling costs. In addition, the sampling costs are the same as those used to cost out verification sampling.

Table IV-102 shows the cost savings to mine operators from no longer having to perform bi-monthly sampling.

Table IV-102:
Total Annual Cost Reductions to Operators Related to
Elimination of Operator Bi-Monthly Sampling

Ug. Coal Mine Size	No. of MMUs^a	No. of Samples Annually per MMU	Sampling Cost per Sample^b	Annual Cost Reductions
<20 emp.	211	39	\$64.43	\$530,194
>20 emp. ≤500 no lgwl	691	43.5	\$62.59	\$1,881,362
>20 emp. ≤500 lgwl	45	43.5	\$37.65	\$73,700
Sub-total	736			\$1,955,061
>500 emp. no lgwl	30	75	\$37.65	\$84,713
>500 emp. lgwl	7	75	\$37.65	\$19,766
Sub-total	37			\$104,479
Annual Cost Reductions				\$2,589,735

^a Number of MMUs (from Table IV-20).

^b Cost per sample (from Table IV-8).

Annual Sampling Dust Data Card Cost Reductions Related to the Elimination of Operator Bi-Monthly Sampling

As a result of mine operators no longer having to perform bi-monthly operator sampling, operators would no longer need to complete the associated dust data cards. Therefore, mine operators would realize cost savings from not spending time to complete dust data cards. Since a dust data card must be completed for each sample, the number of dust data cards no longer needed to be completed equals the number of samples no longer taken, as derived above.

Ninety-six percent of operators that employ fewer than 20 workers and non-longwall operators that employ 20 to 500 workers perform their own sampling. Therefore, in these mines the operator would be responsible for filling out the dust data cards. The remaining 4 percent of operators contract out sampling, and the contractor charge includes the cost to fill out dust data cards.⁵⁴

Therefore, this provision would affect: 203 MMUs (211×0.96) in mines employing fewer than 20 workers; and 663 (691×0.96) non-longwall MMUs in mines employing 20 to 500 workers. For MMUs in other mine categories all sampling is performed by the mine operator, and the mine operator would always be the one to complete the dust card. Thus, this provision would affect:

⁵⁴ The percentage of operators performing their own sampling compared to those that contract out their sampling can be applied to the number of MMUs because the percentages for mines and MMUs within a size type category are approximately the same.

45 longwall MMUs in mines employing 20 to 500 workers; 30 non-longwall MMUs in mines employing more than 500 workers; and 7 longwall MMUs in mines employing more than 500 workers.

MSHA estimates that completing a dust card would take 0.025 hours (about 1.5 minutes) for a mine safety inspector, or equivalent person. The mine safety inspector hourly wage rate is similar to a mine supervisor's wage rate of \$49.79.

Table IV-103 below shows the annual cost savings to operators for not having to complete dust data cards as a result of the elimination of bi-monthly operator sampling.

Table IV-103:
Total Annual Cost Reductions For Dust Data Cards
Related to the Elimination of Operator Bi-Monthly Sampling

Ug. Coal Mine Size	No. of MMUs^a	No. of Dust Cards Annually per MMU	Cost per Dust Card^b	Annual Cost Reductions
<20 emp.	203	39	\$1.24	\$9,855
>20 emp. <500 no lgwl	663	43.5	\$1.24	\$35,899
>20 emp. <500 lgwl	45	43.5	\$1.24	\$2,437
Sub-total	708			\$38,336
>500 emp. no lgwl	30	75	\$1.24	\$2,801
>500 emp. lgwl	7	75	\$1.24	\$653
Sub-total	37			\$3,454
Annual Cost Reductions				\$51,645

^a 203 MMUs = (0.96 x 211 MMUs), 663 MMUs = (0.96 x 691 MMUs), all other MMUs from Table IV-20.

^b \$1.24 rate = 0.025 hours x \$49.79 wage.

Annual Cost Reductions For Sending Samples and Dust Data Cards to MSHA Related to the Elimination of Operator Bi-Monthly Sampling

As a result of mine operators no longer having to perform bi-monthly operator sampling, operators would no longer need to send the samples and related dust cards to MSHA for analysis. Therefore, mine operators would realize cost savings from not spending time to send the materials. The number of samples and dust data cards for which operators would realize a savings from not sending such materials to MSHA is the same as the number of samples and dust data cards that no longer need to be completed.

MSHA estimates that it takes a certified dust technician about 0.0833 hours (or 5 minutes) to prepare and send in one sample along with any relevant data to MSHA. The estimated postage cost is about \$0.50 per sample.

For 96 percent of MMUs in mines employing: (1) fewer than 20 workers, and (2) 20 to 500 workers in non-longwall MMUs, sampling is performed by the operator. Therefore, for MMUs in these mines, the operator would complete the dust data cards. The remaining 4 percent of MMUs are in mines where the operators contract out sampling, and the contractor charge includes the cost to send in the verification samples and dust data cards. Thus, this provision would affect 203 mines $[211 \times 0.96]$ MMUs in mines employing fewer than 20 workers, and 663 $[691 \times 0.96]$ non-longwall MMUs in mines employing 20 to 500 workers. For MMUs

in other mine categories, sampling is performed by the mine operator. Therefore, this provision would affect 45 longwall MMUs in mines employing 20 to 500 workers, 30 non-longwall MMUs in mines employing more than 500 workers, and 7 longwall MMUs in mines employing more than 500 workers.

Table IV-104 shows operators' annual cost savings from not having to send bi-monthly samples and dust data cards to MSHA for analysis.

Table IV-104:
Total Annual Cost Reductions Related to Sending in Operator
Bi-Monthly Samples and Dust Cards to MSHA

Ug. Coal Mine Size	No. of MMUs^a	No. of Materials to Send Annually per MMU	Costs to Send in Materials^b	Annual Cost Reductions
<20 emp.	203	39	\$2.08	\$16,489
>20 emp. ≤500 no lgwl	663	43.5	\$2.08	\$60,066
>20 emp. ≤500 lgwl	45	43.5	\$2.08	\$4,077
Sub-total	708			\$64,143
>500 emp. no lgwl	30	75.00	\$2.08	\$4,686
>500 emp. lgwl	7	75.00	\$2.08	\$1,093
Sub-total	37			\$5,779
Annual Cost Reductions				\$86,411

^a Number of MMUs (from Table IV-71).

^b \$2.08 rate = (0.0833 hours x \$19 wage) + \$0.50

Summary of Cost Reductions Related to the Elimination of
Operator Bi-Monthly Sampling

Table IV-105 presents, by mine size category, a summary of the cost reductions that have been discussed above. These cost reductions result from mine operators no longer having to perform bi-monthly sampling.

**Table IV-105: Summary of Annual Cost Reductions
Related to the Elimination of Operator Bi-Monthly Sampling ***

Underground Coal Mines				
Estimated Costs by Category	<20	≥ 20 empl ≤ 500	>500	Total
Bi-Monthly Sampling	\$530,194	\$1,955,061	\$104,479	\$2,589,735
Dust Cards	\$9,855	\$38,336	\$3,454	\$51,645
Send Samples to MSHA	\$16,489	\$64,143	\$5,779	\$86,411
Total Cost Reductions	\$556,538	\$2,057,540	\$113,712	\$2,727,791

* Source: Table IV-102 through Table IV-104

PART 2 - COST SAVINGS RELATED TO THE BLACK LUNG PROGRAM

As previously noted in Chapter III of this PREA, one of the benefits of reduced overexposures to respirable coal mine dust resulting from the proposed SFSS and PV rules would be an incremental decline in the number of Black Lung Program cases over time. A large proportion of this decline would translate into a direct cost savings for coal mine operators.

In 1980, the Black Lung Program estimated that average lifetime payouts borne by responsible operators for each married miner in the program was about \$248,700 dollars, assuming a 7 percent annual rate of increase;⁵⁵ that sum is equivalent to \$491,967 per case in 1998 dollars.⁵⁶ As MSHA estimated in Chapter III of this PREA, over a 45 year working life approximately 37 cases of simple CWP and PMF would be prevented as a result of the proposed SFSS and PV rules. That is equivalent to approximately 0.82 cases per year. In fiscal year 1999, 66 percent of the 443 claims for Black Lung Benefits accepted as new cases were the financial responsibility of coal mine operators.⁵⁷ If that percentage were applied to the 0.82 cases per year prevented by the proposed SFSS and PV rules, then

⁵⁵U. S. Department of Labor, Employment Standards Administration (1986), Estimated Average Total Cost of Future Monthly Benefits for Trust Fund and Responsible Operator Claims (approved in 1980), page 9.

⁵⁶As determined by the Bureau of Labor Statistics (BLS), this estimate reflects a rise in the Consumer Price Index (CPI) for all urban consumers, all items, from 82.4 in 1980 to 163.0 in 1998, an increase of 97.8 percent.

⁵⁷Peed, Daniel. Memorandum of September 18, 2000.

these proposed rules would eliminate the coal mine operators' financial obligations for approximately 0.54 Black Lung cases per year. As shown in Table IV-106, that amount is equivalent to \$265,662 in 1998 dollars. These cost savings are apportioned by mine size class in Table IV-106 on the basis of the relative number of prevented cases of simple CWP and PMF, by mine size class, for affected D.O.s and affected N.D.O.s.⁵⁸

To the extent that we likely underestimated the magnitude and frequency of overexposures to respirable coal mine dust, it is likely that more Black Lung Program cases would be prevented than we have estimated. Hence, the cost savings to operators (for payments to the Black Lung Program) due to the proposed rules is likely to be larger than we have estimated.

MSHA requests comments on its analysis of the cost savings to mine operators related to reduced Black Lung Program payouts resulting from the proposed PV rule.

⁵⁸As derived from Tables III-1 and III-2, for coal mines with fewer than 20 employees, the proposed SFSS and PV rules would prevent approximately 2.4 cases of simple CWP or PMF for D.O.s and approximately 2.1 cases for N.D.O.s. For coal mines with between 20 and 500 employees, the proposed SFSS and PV rules would prevent approximately 15.9 cases of simple CWP or PMF for D.O.s and approximately 14.2 cases for N.D.O.s. For coal mines with more than 500 employees, the proposed SFSS and PV rules would prevent approximately 1.1 cases of simple CWP or PMF for D.O.s and approximately 1.0 case for N.D.O.s.

Table IV-106:

Total Annual Cost Savings Related to Black Lung Benefits

Mine Size	< 20 emp.	>20 emp. <500	>500 emp.	Total
Share of Annual Black Lung Savings	12.26%	82.02%	5.72%	100%
Annual Black Lung Savings	\$32,570	\$217,896	\$15,196	\$265,662

Net Cost of Proposed PV Rule

The proposed PV rule net compliance costs to mine operators are derived by subtracting operator cost savings from the operator costs to implement the PV rule. The cost savings that arise from the PV rule are: (1) savings associated with reducing citations issued from MSHA inspector samples that are base on SFSS results, (2) savings associated with reducing citations that are based on results from operator bi-monthly samples; (3) savings associated with the elimination of operators' bi-monthly sampling, and (4) savings from reduced black lung benefits to miners paid by mine operators. Table IV-107 presents the annual net cost of the proposed PV rule. As that table shows, the proposed PV rule would provide a net cost savings of approximately \$2.05 million annually. In addition, Table IV-108 shows that the proposed PV rule would reduce operator penalty costs by about \$403,000 annually.

Table IV - 107:

PV Cost Increase Summary for Coal Mine Operators *

Detail	<20 Emp.			≥20 Emp. ≤500			>500 Emp.			Total		
	Annual-ized Costs	Annual Costs	Yearly Costs ^a	Annual-ized Costs	Annual Costs	Yearly Costs ^a	Annual-ized Costs	Annual Costs	Yearly Costs ^a	Annual-ized Costs	Annual Costs	Yearly Costs ^a
UNDERGROUND COAL MINES												
PV Rule												
Compliance Costs	\$70,973	\$346,688	\$417,661	\$566,960	\$3,285,067	\$3,852,027	\$58,653	\$420,105	\$478,758	\$696,586	\$4,051,860	\$4,748,446
Reduced Inspector Citations ^b	\$16,406	-\$534,712	-\$518,306	\$52,289	-\$1,658,063	-\$1,605,774	\$2,352	-\$71,301	-\$68,949	\$71,047	-\$2,264,076	-\$2,193,029
Reduced Operator Citations ^c	\$7,456	-\$247,790	-\$240,334	\$41,723	-\$1,334,380	-\$1,292,657	\$2,753	-\$76,901	-\$74,148	\$51,932	-\$1,659,071	-\$1,607,139
Eliminate Bi-Mo. - Sampling	\$0	-\$556,538	-\$556,538	\$0	-\$2,057,540	-\$2,057,540	\$0	-\$113,712	-\$113,712	\$0	-\$2,727,790	-\$2,727,790
Black Lung Savings	\$0	-\$32,570	-\$32,570	\$0	-\$217,896	-\$217,896	\$0	-\$15,196	-\$15,196	\$0	-\$265,662	-\$265,662
Net PV Rule	\$94,835	-\$1,024,922	-\$930,087	\$660,972	-\$1,982,812	-\$1,321,840	\$63,758	\$142,995	\$206,753	\$819,565	-\$2,864,739	-\$2,045,174

* Annualized Cost and Annual Cost Data from Tables IV-63, IV-81, IV-100, IV-105, and IV-106.

^a Yearly Costs equals Annualized Costs plus Annual Costs

^b Reduced costs related to: (1) reduction in citations issued based on MSHA inspector sample results due to better mine ventilation plans arising from PV rule, and (2) reduction in abatement sampling and associated costs due to elimination of bi-monthly operator sampling.

^c Reduced costs related to: (1) reduction in citations issued based on operator sample results due to better mine ventilation plans arising from PV rule, and (2) reduction in abatement sampling and associated costs due to elimination of bi-monthly operator sampling.

Table IV-108
PV Annual Penalty Cost Summary *

Annual Penalties				
Detail	< 20 Emp.	>20 Emp. <500	> 500 Emp.	Total
UNDERGROUND COAL MINES				
PV Rule				
Reduced Inspector Citations	-\$28,468	-\$202,334	-\$5,263	-\$236,065
Reduced Operator Citations	-\$13,309	-\$160,956	-\$4,960	-\$179,225
Sub-total Reduction	-\$41,777	-\$363,290	-\$10,223	-\$415,290

* Data from Tables IV-82 and IV-101.

FEASIBILITY

As discussed in Part XII of the preamble of the proposed SFSS rule and in Part VIII of the preamble of the proposed PV rule, MSHA has concluded that the requirements of the final rules, both separately and in combination, are technologically and economically feasible.

The Proposed SFSS Rule

MSHA, in consultation with NIOSH, believes that compliance with the proposed SFSS rule would be technologically feasible for the mining industry. The SFSS rule would predominantly affect MSHA's procedures since MSHA alone conducts inspector sampling. However, due to the promulgation of the SFSS rule, some operators would experience a slight increase in the number of abatement samples they would conduct using current technology. After the promulgation of the SFSS rule, coal mine operators would continue to comply with the existing respirable dust concentration limit of 2.0 mg/m³. Such compliance with the applicable standard has proven feasible over the years. Furthermore, compliance determination based on an inspector, single, full-shift sample was found to be technologically feasible during the prior effective Interim Single-Sample Enforcement Policy (ISSEP), in effect from March 2, 1998 through September 4, 1998.

MSHA, in consultation with NIOSH, believes that the SFSS

rule would be economically feasible for the coal mining industry. As previously estimated in this chapter, the coal mining industry would incur costs of approximately \$1.8 million yearly to comply with the proposed SFSS rule. Coal mine operators would also incur approximately an additional \$0.2 million yearly in penalty costs associated with the additional citations arising from the proposed SFSS rule. That the total \$2.0 million borne yearly by the coal mining industry as a result of the proposed SFSS rule is well less than 1 percent (about 0.01 percent) of the industry's yearly revenues of \$19.8 billion provides convincing evidence that the proposed rule is economically feasible.

The Proposed PV Rule

In designing the proposed PV rule, MSHA has taken into account its experience and those of the operators to ensure that the rule provides additional protection from occupational exposure to respirable coal mine dust using current compliance technology (while encouraging technological improvements). For this reason, MSHA believes the proposed PV rule is technologically feasible. MSHA requires mine operators to utilize all feasible engineering or environmental controls, which are specified in the mine ventilation plan, to maintain concentrations of respirable dust in the work environment of MMUs at or below the applicable dust standard. Mine operators

therefore would not be required to implement engineering or environmental controls that were not technologically feasible.

Based on its vast experience in the sampling of respirable dust levels in the MMU work environment, MSHA believes that technology is currently available to control respirable dust to levels at or below the applicable level at MMUs employing continuous and conventional methods of mining. However, MSHA recognizes that, unlike other mining systems, longwall MMUs may have acute dust problems caused by the face-ventilation airstream carrying the shearer-generated face dust over the miners working downwind along the face. In these high-production longwall MMUs, improvements in dust control technology have not kept pace with increases in production technology. For this reason, the proposed PV rule would allow longwall operators who have trouble in meeting MSHA's respirable dust standard and who have exhausted all feasible engineering and environmental controls to use administrative controls or loose-fitting powered air-purifying respirators (PAPRs), until other feasible controls become available.

The PV rule would clearly be economically feasible for the underground coal mining industry since, as previously estimated in this chapter, the underground coal mining industry would derive net compliance cost savings of approximately \$2.04 million yearly from the proposed PV rule. (Although implementing the PV

rule would cost about \$4.75 yearly, there would be offsetting yearly savings of \$2.19 million from reduced mine operator citations based on results from inspector single, full-shift samples and associated abatement sampling; \$1.61 million from reduced mine operator citations on results from operators' bi-monthly samples and associated abatement sampling; \$2.73 million from the elimination of operator bi-monthly sampling; and \$0.27 million from reduced payouts by mine operators for Black Lung cases.) Underground coal mine operators would also obtain a yearly cost savings of approximately \$0.42 million in reduced penalty costs associated with the reduction in mine operator citations arising from the proposed PV rule. The proposed PV rule would therefore provide a total yearly cost savings (including net reduced penalty costs) of \$2.46 million to the underground coal mining industry.

Economic Feasibility of the Proposed SFSS and PV Rules in Combination

MSHA believes that the combination of the proposed SFSS and PV rules would be economically feasible for the underground and surface coal mining industries.

The underground coal mining industry would incur costs of approximately \$1.79 million yearly to comply with the applicable coal mine dust standard under the proposed SFSS rule. Underground coal mine operators would incur approximately an

additional \$0.2 million yearly in penalty costs associated with the additional citations arising from the proposed SFSS rule. Because of the proposed PV rule, underground coal mines would derive net compliance cost savings of approximately \$2.04 million yearly, and would, in addition, obtain yearly cost savings of approximately \$0.42 million in reduced penalty costs associated with the reduction in mine operator citations. Thus, the proposed SFSS and PV rules in combination would provide a net savings (including reduced penalty costs) to the underground coal mining industry of about \$0.47 million yearly.

The surface coal mining industry is covered by the proposed SFSS rule but not by the proposed PV rule. The surface coal mining industry would incur costs of approximately \$5,000 annually to comply with the proposed SFSS rule. In addition, surface coal mine operators would incur approximately an additional \$1,000 in penalty costs associated with the additional citations arising from the proposed SFSS rule. Thus, the total cost to the surface coal mining industry of the proposed SFSS and PV rules in combination (recalling that this industry is not covered by the PV rule) would be about \$6,000 yearly, which is well less than 1 percent (about 0.0001 percent) of yearly industry revenues of \$12.2 billion.

V. REGULATORY FLEXIBILITY CERTIFICATION

INTRODUCTION

Pursuant to the Regulatory Flexibility Act of 1980 as amended, MSHA has analyzed the impact of the proposed SFSS and PV rules on small businesses. Further, MSHA has made a preliminary determination with respect to whether or not the Agency can certify that these proposed rules would not have a significant economic impact on a substantial number of small entities that are affected by these rulemakings. Under the Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the Regulatory Flexibility Act (RFA), MSHA must include in the proposal a factual basis for this certification. If the proposed rules have a significant economic impact on a substantial number of small entities, then the Agency must develop an initial regulatory flexibility analysis.

DEFINITION OF A SMALL MINE

Under the RFA, in analyzing the impact of a proposed rule on small entities, MSHA must use the SBA definition for a small entity or, after consultation with the SBA Office of Advocacy, establish an alternative definition for the mining industry by publishing that definition in the Federal Register for notice and comment. MSHA has not taken such an action, and hence is

required to use the SBA definition.

The SBA defines a small entity in the mining industry as an establishment with 500 or fewer employees (13 CFR 121.201). Almost all of the coal mines affected by these rulemakings fall into this category and hence can be viewed as sharing the special regulatory concerns which the RFA was designed to address.

Traditionally, the Agency has also looked at the impacts of its proposed rules on a subset of mines with 500 or fewer employees—those with fewer than 20 employees, which the mining community refers to as "small mines." These small mines differ from larger mines not only in the number of employees, but also, among other things, in economies of scale in material produced, in the type and amount of production equipment, and in supply inventory. Therefore, their costs of complying with MSHA rules and the impact of MSHA rules on them will also tend to be different. It is for this reason that "small mines," as traditionally defined by the mining community, are of special concern to MSHA.

This analysis complies with the legal requirements of the RFA for an analysis of the impacts on "small entities" while continuing MSHA's traditional look at "small mines." MSHA concludes that it can certify that the proposed SFSS and PV rules would not have a significant economic impact on a substantial number of small entities that are affected by these rulemakings.

The Agency determined that this is the case both for mines affected by these rulemakings with fewer than 20 employees and for mines affected by these rulemakings with 500 or fewer employees.

FACTUAL BASIS FOR CERTIFICATION

General Approach

The Agency's analysis of impacts on "small entities" begins with a "screening" analysis. The screening compares the estimated compliance costs of a proposed rule for small entities in the sector affected by the rule to the estimated revenues for those small entities. When estimated compliance costs are less than 1 percent of the estimated revenues, or they are negative (that is, they provide a cost savings), the Agency believes it is generally appropriate to conclude that there is no significant economic impact on a substantial number of small entities. When estimated compliance costs exceed 1 percent of revenues, it tends to indicate that further analysis may be warranted.

The Agency welcomes comments on its screening methodology.

Derivation of Costs and Revenues

The compliance costs noted in this chapter were previously presented in Chapter IV of this document along with an explanation of how they were derived. All underground and

surface coal mines are affected by the proposed SFSS rule. However, only underground coal mines are affected by the proposed PV rule.

In determining revenues for underground and surface coal mines, MSHA multiplied their production data (in tons) by the estimated price per ton of the commodity (\$17.58 per ton in 1998). The production data were obtained from MSHA's CM441 reports⁵⁹ and the price estimates were obtained from the Department of Energy.⁶⁰

Results of screening analysis

The proposed SFSS rule applies to all underground and surface coal mines. Table V-1 shows that the estimated yearly cost of the proposed SFSS rule as a percentage of yearly revenues is about 0.1 percent for underground coal mines with fewer than 20 employees and less than 0.01 percent for surface coal mines with fewer than 20 employees. The estimated yearly cost of the proposed SFSS rule as a percentage of yearly revenues is about 0.03 percent for underground coal mines with 500 or fewer employees and less than 0.01 percent for surface coal mines with 500 or fewer employees.

⁵⁹ MSHA's 1997 CM441 Report, cycle 1997/184.

⁶⁰ Department of Energy, Energy Information Administration, Annual Energy Review 1998, p. 203.

**TABLE V-1: Estimated Yearly Costs of Proposed SFSS Rule
Relative to Yearly Revenues
for Underground and Surface Coal Mines
(dollars in thousands)**

Mine Size	Mine Type	SFSS Rule Yearly Costs ^a	Revenues ^b	Costs as Percentage of Revenues
< 20 emp.	Underground	\$369.5	\$249,418	0.1%
	Surface	\$1.1	\$498,935	< 0.01%
≤500 emp.	Underground	\$1,772.6	\$6,883,339	0.03%
	Surface	\$5.2	\$10,864,156	< 0.01%

^a Estimated yearly costs are composed of only annual costs. There are no first year costs or annualized costs in the SFSS rule.

^b Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 1997 Final MIS data (quarter 1 - quarter 4), CM441, cycle 1997/184; and U.S. Department of Energy, Energy Information Administration, Annual Energy Review 1998, DOE/EIA-0384(98), July 1999, p 203.

The proposed PV rule applies only to underground coal mines. Table V-2 shows that for underground coal mines with fewer than 20 employees the proposed PV rule provides a net yearly cost savings (combining net annualized costs and net annual costs) of about \$0.9 million. For underground coal mines with 500 or fewer employees, the proposed PV rule provides a net yearly cost savings of about \$2.3 million.

Table V-3 shows the combined yearly costs of the proposed SFSS and PV rules relative to yearly revenues for "small" underground and surface coal mines. For surface coal mines, which are affected only by the SFSS rule, the estimated yearly cost of the rule as a percentage of yearly revenue is less than 0.01 percent both for surface coal mines with fewer than 20 employees and for those with 500 or fewer employees. For underground coal mines, the proposed SFSS and PV rules provides a combined estimated yearly cost savings of about \$0.6 million for underground coal mines with fewer than 20 employees and about \$0.5 million for underground coal mines with 500 or fewer employees.

**TABLE V-2: Estimated Yearly Costs of Proposed PV Rule
Relative to Yearly Revenues
for Underground Coal Mines
(dollars in thousands)**

Mine Size	PV Rule Net Costs ^a	Underground Coal Mine Revenues ^b	Costs as Percentage of Revenues
< 20 emp.	(\$930.1)	\$249,418	(0.4%)
≤500 emp.	(\$2,251.9)	\$6,883,339	(0.03%)

^a Estimated yearly costs are composed of "adjusted" first year costs that have been annualized plus annual costs.

^b Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 1997 Final MIS data (quarter 1 - quarter 4), CM441, cycle 1997/184; and U.S. Department of Energy, Energy Information Administration, Annual Energy Review 1998, DOE/EIA-0384(98), July 1999, p 203.

**TABLE V-3: Estimated Combined Yearly Costs of Proposed
SFSS and PV Rules Relative to Yearly Revenues
for Underground and Surface Coal Mines
(dollars in thousands)**

Mine Size	Mine Type	SFSS and PV Rules Yearly Costs ^a	Revenues ^b	Costs as Percentage of Revenues
< 20 emp.	Underground	(\$560.1)	\$249,418	(0.2%)
	Surface	\$1.1	\$498,935	< 0.01%
≤500 emp.	Underground	(\$479.3)	\$6,883,339	(0.01%)
	Surface	\$5.2	\$10,864,156	< 0.01%

^a Estimated yearly costs for the PV rule are composed of annualized costs plus annual costs. However, yearly costs for the SFSS rule consist only of annual costs because there are no annualized costs in the SFSS rule.

^b Data for revenues derived from: U.S. Department of Labor, Mine Safety and Health Administration, Office of Standards, Regulations, and Variances, based on 1997 Final MIS data (quarter 1 - quarter 4), CM441, cycle 1997/184; and U.S. Department of Energy, Energy Information Administration, Annual Energy Review 1998, DOE/EIA-0384(98), July 1999, p 203.

Whether viewing the proposed SFSS and PV rules separately or in combination and whether a small mine is defined as one with fewer than 20 employees or one with 500 or fewer employees, the estimated compliance costs are either negative or substantially less than 1 percent of estimated coal revenues, well below the level suggesting that they might have a significant economic impact on a substantial number of small entities. Accordingly, MSHA has certified that there is no significant economic impact on a substantial number of small entities in the coal mining industry that are covered by these proposed rules.

As required under the law, MSHA is complying with its obligation to consult with the Chief Counsel for Advocacy on these proposed rules, and on the Agency's certification of no significant economic impact on a substantial number of small entities covered by these proposed rules. Consistent with Agency practice, notes of any meetings with the Chief Counsel's office on these proposed rules, or any written communications, will be placed in the rulemaking record.

VI. OTHER REGULATORY CONSIDERATIONS

THE UNFUNDED MANDATES REFORM ACT

For purposes of the Unfunded Mandates Reform Act of 1995, the SFSS and PV rules do not include any Federal mandate that may result in increased expenditures by State, local, or tribal governments, or increased expenditures by the private sector of more than \$100 million.

NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) of 1969 requires each Federal agency to consider the environmental effects of proposed actions and to prepare an Environmental Impact Statement on major actions significantly affecting the quality of the environment. MSHA has reviewed the proposed SFSS and PV rules in accordance with NEPA requirements (42 U.S.C. 4321 *et. seq.*), the regulations of the Council of Environmental Quality (40 CFR Part 1500), and the Department of Labor's NEPA procedures (29 CFR Part 11). As a result of this review, MSHA has preliminarily determined that these proposed rules would have no significant environmental impact.

Commenters are encouraged to submit their comments on this determination.

EXECUTIVE ORDER 12630: GOVERNMENT ACTIONS AND INTERFERENCE WITH
CONSTITUTIONALLY PROTECTED PROPERTY RIGHTS

This rule is not subject to Executive Order 12630,
Government Actions and Interference with Constitutionally
Protected Property Rights, because it does not involve
implementation of a policy with takings implications.

EXECUTIVE ORDER 12988: CIVIL JUSTICE REFORM

The Agency has reviewed Executive Order 12988, Civil Justice
Reform, and determined that the proposed SFSS and PV rules would
not unduly burden the Federal court system. The proposed rules
have been written so as to provide a clear legal standard for
affected conduct, and have been reviewed carefully to eliminate
drafting errors and ambiguities.

EXECUTIVE ORDER 13045: PROTECTION OF CHILDREN FROM ENVIRONMENTAL
HEALTH RISKS AND SAFETY RISKS

In accordance with Executive Order 13045, MSHA has evaluated
the environmental health and safety effects of the proposed SFSS
and PV rules on children. The Agency has determined that the
proposed rules would not have an adverse impact on children.

EXECUTIVE ORDER 13084: CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

MSHA certifies that the proposed SFSS and PV rules would not impose substantial direct compliance costs on Indian tribal governments.

EXECUTIVE ORDER 13132: FEDERALISM

MSHA has reviewed the proposed SFSS and PV rules in accordance with Executive Order 13132 regarding federalism and has determined that they do not have "federalism implications." The proposed rules do not "have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

VII. PAPERWORK REDUCTION ACT of 1995

INTRODUCTION

The purpose of this chapter is to show the burden hours and related costs which would be borne by underground and surface coal mine operators as a result of the proposed SFSS and PV rules. The costs in this chapter have already been derived in Chapter IV of this PREA. However, in this chapter, costs are estimated only in relation to the burden hours that the proposed rules impose on mine operators and miners. Therefore, not all costs derived in Chapter IV appear below. Those costs derived in Chapter IV which do not have burden hours related to them do not appear in this chapter.

SUMMARY OF PAPERWORK BURDEN HOURS AND RELATED COSTS

The proposed SFSS rule does not have any burden hours that occur only in the first year (which MSHA terms "first year" burden hours). However, the proposed SFSS rule does have annual burden hours beginning in the first year and recurring every year thereafter. Both underground and surface coal mines have paperwork provisions under the proposed SFSS rule.

The proposed PV rule has first year burden hours (those that occur only in the first year) and annual burden hours which occur in the first year and every year thereafter. Only underground

coal mines have paperwork provisions under the proposed PV rule.

The handling of some types of PV burden hours and costs requires explanation. In a few cases, the proposed PV rule imposes burden hours and costs that would be the same every year, beginning with the first year that the rule takes effect. These are "annual" burden hours and costs, as traditionally defined. In most cases, however, the proposed PV rule imposes burden hours and costs which would be the same each year starting with the second year the PV rule is in effect, but whose first year burden hours and costs would be different. MSHA transformed these first year burden hours and costs and annual burden hours and costs starting in Year 2 into adjusted first year burden hours and costs (first year burden hours and costs minus an amount equal to annual burden hours and costs starting with Year 2 after the rule takes effect) and true annual burden hours and costs starting in Year 1 after the rule takes effect.⁶¹

Underground Coal Mines

First Year Burden Hours

In the first year the combined SFSS and PV rules are in effect, there would be a total net burden hour savings, for

⁶¹ A hypothetical example might help to explain this procedure. Suppose that burden costs are \$2,000 the first year and \$400 each year thereafter. The adjustment procedure simply splits first year burden costs into two parts: (1) \$400, for the first year of annual burden costs; and (2) the residual \$1,600. Consequently, adjusted first year burden costs would be \$1,600 and annual burden costs (starting in year 1) would be \$400.

underground coal mine operators, of 41,737, which is composed of 7,912 first year burden hours (from Table VII-1 below) and 49,649 annual burden hour savings (from Table VII-1(a) below). The 41,737 net burden hour savings have associated cost savings of \$773,404, which is composed of \$360,820 of first year costs (from Table VII-1) and \$1,134,224 of annual cost savings (from Table VII-1(a)).

Annual Burden Hours in Second Year and Every Year Thereafter

There would be a total net annual burden hour savings, for underground coal mine operators, in the second year the combined rules are in effect and every year thereafter of 49,649, which has associated cost savings of \$1,134,224 annually (from Table VII-1(a)). These net burden hours and costs include annual burden hour and cost savings due to: reduced mine operator citations issued based on MSHA inspector sample results; reduced mine operator citations issued based on operator bi-monthly sample results; the elimination of operator abatement sampling performed in order to abate a citation; and the fact that operators would no longer have to perform bi-monthly operator sampling.

Surface Coal Mines

Only the proposed SFSS rule has paperwork provisions for

surface coal mines. The proposed SFSS rule would impose no first year only burden hours or costs on surface coal mines. As shown in Table VII-1(a), the total annual burden hours for surface coal mines, beginning in the first year, would be 29 hours, with associated costs of \$1,009.

For Combined SFSS & PV Rule

Table VII-1

Summary of First Year Paperwork Burden Hours and Related Costs That Occur Only in the First Year *

Detail	<20 emp.			≥20 emp. ≤500			>500 emp.			Total		
	Adjusted First Year Hours	Adjusted First Year Costs	Adjusted First Year Costs Annualized	Adjusted First Year Hours	Adjusted First Year Costs	Adjusted First Year Cost Annualized	Adjusted First Year Hours	Adjusted First Year Costs	Adjusted First Year Cost Annualized	Adjusted First Year Hours	Adjusted First Year Costs	Adjusted First Year Cost Annualized
UNDERGROUND COAL MINES												
SFSS Rule Alone	0	\$0	\$0	0	\$0	\$0	0	\$0	\$0	0	\$0	\$0
PV Rule												
Increase	1,359	\$61,059	\$4,274	6,140	\$280,581	\$20,372	398	\$18,425	\$1,399	7,897	\$360,065	\$26,045
Reduced Inspector Citations ^a	3	\$151	\$11	6	\$302	\$21	0	\$0	\$0	9	\$453	\$32
Reduced Operator Citations ^b	3	\$151	\$11	3	\$151	\$11	0	\$0	\$0	6	\$302	\$22
Elimination of Bi-Mo. Sampling	0	\$0	\$0	0	\$0	\$0	0	\$0	\$0	0	\$0	\$0
Net PV Rule	1,365	\$61,361	\$4,296	6,149	\$281,034	\$20,404	398	\$18,425	\$1,399	7,912	\$360,820	\$26,099
SFSS & PV Rules Combined	1,365	\$61,361	\$4,296	6,149	\$281,034	\$20,404	398	\$18,425	\$1,399	7,912	\$360,820	\$26,099
SURFACE COAL MINES												
SFSS Rule Alone	0	\$0	\$0	0	\$0	\$0	0	\$0	\$0	0	\$0	\$0
UNDERGROUND AND SURFACE COAL MINES												
SFSS & PV Rules Combined	1,365	\$61,361	\$4,296	6,149	\$281,034	\$20,404	398	\$18,425	\$1,399	7,912	\$360,820	\$26,099

* Source Tables VII-32, VII-43, and VII-53.

^a Related to reduced citations issued based on inspector sample results due to better mine ventilation plans arising from the PV rule.

^b Related to reduced citations issued based on operator sample results due to better mine ventilation plans arising from the PV rule.

For Combined SFSS & PV Rule

Table VII-1(a)

Summary of Annual Paperwork Burden Hours and Related Costs That Occur in the First Year and Every Year Thereafter *

Detail	<20 emp.		≥20 emp. ≤500		>500 emp.		Total	
	Annual Hours	Annual Costs	Annual Hours	Annual Costs	Annual Hours	Annual Costs	Annual Hours	Annual Costs
UNDERGROUND COAL MINES								
SFSS Rule Alone	640	\$15,649	2,311	\$56,364	33	\$809	2,984	\$72,822
PV Rule								
Increase	315	\$14,126	1,458	\$63,236	111	\$4,550	1,884	\$81,912
Reduced Inspector Citations ^a	-1,012	-\$24,678	-2,941	-\$71,911	-111	-\$2,695	-4,064	-\$99,285
Reduced Operator Citations ^b	-474	-\$11,606	-2,394	-\$58,386	-105	-\$2,561	-2,973	-\$72,553
Elimination of Bi-Mo. Sampling	-9,084	-\$212,901	-35,350	-\$830,435	-3,075	-\$74,794	-47,509	-\$1,118,130
Net PV Rule	-10,255	-\$235,059	-39,227	-\$897,496	-3,180	-\$75,500	-52,662	-\$1,208,056
SFSS & PV Rules Combined	-9,615	-\$219,410	-36,916	-\$841,132	-3,147	-\$74,691	-49,678	-\$1,135,233
SURFACE COAL MINES								
SFSS Rule Alone	9	\$286	20	\$723	0	\$0	29	\$1,009
UNDERGROUND AND SURFACE COAL MINES								
SFSS & PV Rules Combined	-9,606	-\$219,124	-36,896	-\$840,409	-3,147	-\$74,691	-49,649	-\$1,134,224

* Source Tables VII-7, VII-33, VII-43, VII-53, and 57.

^a Reduction related to: (1) reduced citations issued based on inspector sample results due to better mine ventilation plans arising from the PV rule and (2) reduced abatement sampling and associated costs due to the elimination of bi-monthly operator sampling.

^b Reduction related to: (1) reduced citations issued based on operator sample results due to better mine ventilation plans arising from the PV rule and (2) reduced abatement sampling and associated costs due to the elimination of

In this chapter the following data are used:

- a certified dust technician's hourly wage rate of \$19,
- a mine supervisor's hourly wage rate of \$49.79.

Paperwork costs incurred by mine operators that do not have burden hours attached to them are not included in this chapter. An example of this type of paperwork cost is one in which a mine operator pays a contractor to write a program. In this case, since the mine operator does not write the program, the operator does not incur any burden hours. However, there is still a paperwork burden cost to the operator because the operator is still responsible for paying the contractor for the service, which is categorized as paperwork. The paperwork burden costs discussed above, along with the burden hours and costs in this chapter, are included in the OMB paperwork package that accompanies the proposed rules.

The discussion below of the paperwork provisions for the proposed SFSS and PV rules is separated into two parts. Part 1 discusses paperwork provisions that occur as a result of the proposed SFSS rule. Part 2 discusses paperwork provisions that occur as a result of the proposed PV rule.⁶² The proposed PV rule contains both increased and decreased paperwork provisions. The increased paperwork burden hours are the result of steps

⁶² As noted in Chapter IV, the SFSS and PV rules are being jointly proposed. However, for purposes of exposition, the paperwork provisions of the proposed SFSS rule are examined first, after which the paperwork provisions of the proposed PV rule are examined assuming the proposed SFSS rule has been enacted.

taken by operators to comply with the requirements of the proposed PV rule. The decrease in paperwork in the PV rule rises from: (1) the reduced number of citations issued based on MSHA inspector sample results; (2) the reduced number of citations issued based on operator sample results; (3) the elimination of abatement sampling performed by operators in order to abate a citation; and (4) the operator no longer having to perform bi-monthly sampling.

PART 1 - PAPERWORK PROVISIONS FOR THE SFSS RULE

Existing §§ 70.201(d), 71.201(d), & 90.201(d) Annual Burden Hours and Costs for Abatement Sampling Due to Additional Citations

For each citation, 5 abatement samples are taken. It is estimated to take about 1 hr. to take a sample. This hour is composed of: 0.8333 hrs. for a certified dust technician to prepare, disassemble, and clean the sampler unit after sampling; and 0.1666 hrs. for a mine supervisor to make the required operational checks during the sampling period. The sampling costs, related to the above time, would be \$24.13 per sample $[(0.8333 \times \$19) + (0.1666 \times \$49.79)]$.

Only citations in those mines that perform their own sampling with either their own or rented equipment will have associated burden hours and costs. Thus, the following citations in each mine size category are affected by this paperwork provision.

For underground coal mines:

- 115 citations are in mines employing fewer than 20 workers (96% of citations in this category),
- 363 citations are in non-longwall mines employing 20 to 500 workers (96% of citations in this category),
- 53 citations are in longwall mines employing 20 to 500 workers (100% of citations in this category),
- 5 citations are in non-longwall mines employing more than 500 workers (100% of citations in this category),
- 1 citation is in a longwall mine employing more than 500 workers (100% of citations in this category).

For surface coal mines:

- 1 citation is in a mine employing fewer than 20 workers (53% of citations in this category),
- and 2 citations are in mines employing 20 to 500 workers (72% of citations in this category).

Table VII-2 shows underground and surface coal operators' annual burden hours and costs for abatement sampling due to additional citations.

Table VII-2: Existing 70.201(d), 71.201(d) & 90.201(d)
Total Annual Burden Hours and Costs for Abatement
Sampling Related to the Number of Additional SFSS Citations

Mine Size	No. of Additional Citations	No. of Samples Per Citation	Sample Time (hr.)	Annual Burden (hr.)	Cost Per Sample ^a	Annual Burden Costs
Underground Coal Mines						
<20 emp.	115	5	1	575	\$24.13	\$13,872
≥20 emp. ≤500 no lgwl	363	5	1	1,815	\$24.13	\$43,787
≥20 emp. ≤500 lgwl	53	5	1	265	\$24.13	\$6,393
Sub-Total	416			2,080		\$50,181
>500 emp. no lgwl	5	5	1	25	\$24.13	\$603
>500 emp. lgwl	1	5	1	5	\$24.13	\$121
Sub-Total	6			30		\$724
Total Hours and Costs				2,685		\$64,776
Surface Coal Mines						
<20 emp.	1	5	1	5	\$24.13	\$121
≥20 emp. ≤500	2	5	1	10	\$24.13	\$241
>500 emp.	0	5	1	0	\$24.13	\$0
Total Hours and Costs				15		\$362

^a \$24.13 = (0.8333 x \$19 wage) + (0.1666 hr. x \$49.79 wage)

Existing §§ 70.209(c), 71.209(c) & 90.209(c)
Annual Burden Hours and Costs for Completing Dust Cards for
Abatement Sampling Related to Additional Citations

After each abatement sample is taken, mine operators must complete and sign a dust data card containing information about the sample. Five abatement samples are taken for each citation, and a dust data card must be completed for each sample taken. MSHA estimates that after each sample it would take 0.025 hours (about 1.5 minutes) for a mine safety inspector, or equivalent person, to complete and sign the dust data card. The mine safety inspector hourly wage rate is similar to a mine supervisor's wage rate of \$49.79.

Only citations in those mines that perform their own sampling with either their own or rented equipment will have associated burden hours and costs. Thus, the following citations in each mine size category are affected by this paperwork provision.

For underground coal mines:

- 115 citations are in mines employing fewer than 20 workers (96% of citations in this category),
- 363 citations are in non-longwall mines employing 20 to 500 workers (96% of citations in this category),
- 53 citations are in longwall mines employing 20 to 500 workers (100% of citations in this category),
- 5 citations are in non-longwall mines employing more than 500 workers (100% of citations in this category),
- and 1 citation is in a longwall mine employing more than 500 workers (100% of citations in this category).

For surface coal mines:

- 1 citation is in a mine employing fewer than 20 workers (53% of citations in this category),
- and 2 citations are in mines employing 20 to 500 workers (72% of citations in this category).

Table VII-3 shows underground and surface coal operators' annual burden hours and costs to complete dust data cards.

Table VII-3: Existing 70.209(c), 71.209(c) & 90.209(c)
Total Annual Burden Hours and Costs for Completing Dust Cards
for Abatement Sampling Related to the Number of Additional SFSS Citations

Mine Size	No. of Additional Citations	No. of Samples Per Citation	Time For Card (hrs.)	Annual Burden (hrs.)	Wage Rate	Annual Burden Costs
Underground Coal Mines						
<20 emp.	115	5	0.025	14	\$49.79	\$716
≥20 emp. ≤500 no lgwl	363	5	0.025	45	\$49.79	\$2,259
≥20 emp. ≤500 lgwl	53	5	0.025	7	\$49.79	\$330
Sub-Total	416			52		\$2,589
>500 emp. no lgwl	5	5	0.025	0.63	\$49.79	\$31
>500 emp. lgwl	1	5	0.025	0.13	\$49.79	\$6
Sub-Total	6			0.75		\$37
Total Hours and Costs				67		\$3,342
Surface Coal Mines						
<20 emp.	1	5	0.025	0.13	\$49.79	\$6
≥20 emp. ≤500	2	5	0.025	0.25	\$49.79	\$12
>500 emp.	0	5	0.025	0	\$49.79	\$0
Total Hours and Costs				0.38		\$19

Existing §§ 70.209(a), 71.209(a) & 90.209(a)
Annual Burden Hours and Costs for Sending Abatement Samples
and Dust Cards Due to the Additional Citations to MSHA for
Analysis

Each abatement sample and dust data card is sent by mine operators to an MSHA laboratory for analysis for those mines that perform their own sampling. Five abatement samples are taken and five dust cards are completed for each citation.

MSHA estimates that it takes a certified dust technician 0.0833 hours to prepare and send in 1 sample along with the dust data card to MSHA. There are no burden hours related to postage costs incurred to mail the samples. Therefore, postage is not included in the calculations below as costs related to burden hours.

Only citations in those mines that perform their own sampling with either their own or rented equipment will have associated burden hours and costs. Thus, the following citations in each mine size category are affected by this paperwork provision.

For underground coal mines:

- 115 citations are in mines employing fewer than 20 workers (96% of citations in this category),
- 363 citations are in non-longwall mines employing 20 to 500 workers (96% of citations in this category),
- 53 citations are in longwall mines employing 20 to 500 workers (100% of citations in this category),
- 5 citations are in non-longwall mines employing more than 500 workers (100% of citations in this category),
- and 1 citation is in a longwall mine employing more than 500 workers (100% of citations in this category).

For surface coal mines:

- 1 citation is in a mine employing fewer than 20 workers (53% of citation in this category),
- and 2 citations are in mines employing 20 to 500 workers (72% of citations in this category).

Table VII-4 shows underground and surface coal mine operators' annual burden hours and costs to prepare and send in samples and dust cards to MSHA for analysis.

Table VII-4: Existing 70.209(a), 71.209(a) & 70.209(a)

Total Annual Burden Hours and Costs to Send Abatement Samples and Dust Cards Related to the Number of Additional SFSS Citations to MSHA for Analysis

Mine Size	No. of Additional Citations	No. of Samples & Dust Cards Per Citation	Time to Send (hrs.)	Annual Burden (hrs.)	Tech-nician Wage	Annual Burden Costs
Underground Coal Mines						
<20 emp.	115	5	0.0833	48	\$19	\$910
>20 emp. ≤500 no lgwl	363	5	0.0833	151	\$19	\$2,873
>20 emp. ≤500 lgwl	53	5	0.0833	22	\$19	\$419
Sub-Total	416			173		\$3,292
>500 emp. no lgwl	5	5	0.0833	2.1	\$19	\$40
>500 emp. lgwl	1	5	0.0833	0.4	\$19	\$8
Sub-Total	6			2		\$47
Total Hours and Costs				224		\$4,250
Surface Coal Mines						
<20 emp.	1	5	0.0833	0.42	\$19	\$8
>20 emp. ≤500	2	5	0.0833	0.83	\$19	\$16
>500 emp.	0	5	0.0833	0	\$19	\$0
Total Hours and Costs				1		\$24

Existing §§ 71.300(a) & 90.300(a)
Annual Costs to Write and Submit a Respirable Dust Control
Program for Certain Types of Additional Citations

An operator must write and submit to MSHA a respirable dust control program after either: (1) a surface coal mine operator has abated any type of citation; or (2) an underground coal mine operator has abated a part 90 citation. Under § 71.300(a), the written plan submitted must be applicable to the work position identified in the citation. Under § 90.300(a) the mine operator must submit a written plan for that part 90 miner involved in the citation. MSHA estimates that it would take a mine supervisor an average of 3 hours to write and submit a plan for each citation. Photocopying and postage costs are not related to burden hours and therefore are not included in this section.

For underground mines, the affected mines are:

- 1 part 90 citation in a mine employing fewer than 20 workers,
- 1 part 90 citation assumed to be in a non-longwall mine employing 20 to 500 workers,
- and 1 part 90 citation assumed to be in a longwall mine employing 20 to 500 workers.

For surface mines, the affected mines are:

- 1 citation in a mine employing fewer than 20 workers;
- and 3 citations in mines employing 20 to 500 workers.

Table VII-5 shows underground and surface coal mine operators' annual burden hours and costs to write a respirable dust control plan.

Table VII-5: Existing 71.300(a) & 90.300(a)
Total Annual Burden Hours and Costs to Write and Submit Dust Plans
Related to the Number of Additional SFSS Citations

Mine Size	No. of Dust Plans to Write and Submit	Time to Write and Submit a Plan (hrs.)	Annual Burden (hrs.)	Super-visor Wage (hr.)	Annual Burden Costs
Underground Coal Mines					
<20 emp.	1	3	3	\$49.79	\$149
≥20 emp. ≤500 no lgwl	1	3	3	\$49.79	\$149
≥20 emp. ≤500 lgwl	1	3	3	\$49.79	\$149
Sub-Total	2		6		\$299
>500 emp. no lgwl	0	3	0	\$49.79	\$0
>500 emp. lgwl	0	3	0	\$49.79	\$0
Sub-Total	0		0		\$0
Total Hours and Costs			9		\$448
Surface Coal Mines					
<20 emp.	1	3	3	\$49.79	\$149
≥20 emp. ≤500	3	3	9	\$49.79	\$448
>500 emp.	0	3	0	\$49.79	\$0
Total Hours and Costs			12		\$597

Existing §§ 71.301(d) & 90.301(d)
Annual Costs to Post or Provide a Copy of the Dust Plan

After mine operators have an approved respirable dust control plan then: (1) under § 71.301(d), the operator must post on the mine bulletin board a copy of the approved respirable dust control plan; (2) under § 90.301(d), the operator must provide a copy of the approved respirable dust control plan to the part 90 miner.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and post the plan. For purposes of this cost analysis, MSHA assumes that it would take the same amount of time to copy the plan and give it to the miner as it would to copy and post the plan.

For underground mines, the affected mines are:

- 1 part 90 citation in a mine employing fewer than 20 workers;
- 1 part 90 citation assumed to be in a non-longwall mine employing 20 to 500 workers;
- and 1 part 90 citation assumed to be in a longwall mine employing 20 to 500 workers.

For surface mines, MSHA estimates:

- 1 citation in a mine employing fewer than 20 workers;
- and 3 citations in mines employing 20 to 500 workers.

Table VII-6 shows underground and surface coal mine operators' annual burden hours and costs to copy and post a dust plan or to copy a dust plan and provide it to a miner.

Table VII-6: Existing 71.301(d) & 90.301(d)
Total Annual Burden Hours and Costs to Post or Give Dust Plans to
Miners That are Related to the Number of Additional SFSS Citations

Mine Size	No. of Dust Plans	Time to Copy or Provide Dust Plan (hrs.)	Annual Burden (hrs.)	Clerical Wage	Annual Burden Costs
Underground Coal Mines					
<20 emp.	1	0.1	0.1	\$18.56	\$2
>20 emp. ≤500 no lgwl	1	0.1	0.1	\$18.56	\$2
≥20 emp. ≤500 lgwl	1	0.1	0.1	\$18.56	\$2
Sub-Total	2		0.2		\$4
>500 emp. no lgwl	0	0.1	0	\$18.56	\$0
>500 emp. lgwl	0	0.1	0	\$18.56	\$0
Sub-Total	0		0		\$0
Total Hours and Costs			0.3		\$6
Surface Coal Mines					
<20 emp.	1	0.1	0.1	\$18.56	\$2
>20 emp. ≤500	3	0.1	0.3	\$18.56	\$6
>500 emp.	0	0.1	0	\$18.56	\$0
Total Hours and Costs			0.4		\$7

Table VII-7 provides a summary of the paperwork provisions discussed above that involve annual increased paperwork burden hours and related costs for the additional SFSS citations arising from the proposed SFSS rule.

Table VII-7:
Summary of Total Annual Burden Hours and Costs for Mine Operators
Related to the Number of Additional SFSS Citations *

Detail	<20 emp.		≥20 emp. <500		>500 emp.		Total	
	Hrs.	Costs	Hrs.	Costs	Hrs.	Costs	Hrs.	Costs
Underground Coal Mines								
Abatement Sampling	575	\$13,872	2,080	\$50,181	30	\$724	2,685	\$64,776
Dust Data Cards	14	\$716	52	\$2,589	1	\$37	67	\$3,342
Send Samples to MSHA	48	\$910	173	\$3,292	2	\$47	224	\$4,250
Prepare Dust Plan	3	\$149	6	\$299	0	\$0	9	\$448
Post or Give Dust Plan	0.1	\$2	0.2	\$4	0	\$0	0	\$6
Total Underground	640	\$15,649	2,311	\$56,364	33	\$809	2,985	\$72,822
Surface Coal Mines								
Abatement Sampling	5	\$121	10.00	\$241	0	\$0	15.00	\$362
Dust Data Cards	0.1	\$6	0.25	\$12	0	\$0	0.38	\$19
Send Samples to MSHA	0.4	\$8	0.83	\$16	0	\$0	1.25	\$24
Prepare Dust Plan	3	\$149	9	\$448	0	\$0	12.00	\$597
Post or Give Dust Plan	0.1	\$2	0.3	\$6	0	\$0	0.40	\$7
Total Surface	9	\$286	20	723	0	\$0	29	\$1,009
Underground and Surface Coal Mines								
Abatement Sampling	580	\$13,993	2,090	\$50,422	30	\$724	2,700	\$65,138
Dust Data Cards	15	\$722	52	\$2,602	1	\$37	68	\$3,361
Send Samples to MSHA	48	\$918	174	\$3,308	2	\$47	225	\$4,273
Prepare Dust Plan	6	\$299	15	\$747	0	\$0	21	\$1,046
Post or Give Dust Plan	0	\$4	1	\$9	0	\$0	1	\$13
Total Underground & Surface	649	\$15,935	2,332	\$57,087	33	\$809	3,014	\$73,831

* Source: Table VII-2 through Table VII-6.

PART 2 - PAPERWORK PROVISIONS FOR THE PV RULE

Existing § 75.370 Pursuant to Proposed § 70.203(a) Underground Coal Mine Operators' First Year Burden Hours and Costs to Revise Ventilation Plans

As a result of the PV rule, MSHA assumes that all underground coal mine operators would initially need to revise their mine ventilation plans before they attempt verification sampling. MSHA estimates that each mechanized mining unit (MMU) sampled would generate a revision to the mine ventilation plan that would take a mine supervisor about: 5 hours for mines employing fewer than 20 workers, 6 hours for mines employing 20 to 500 workers, and 7 hours for mines employing more than 500 workers.

After the first round of verification sampling, some operators would fail to be at or below the critical values noted in the proposed PV rule, and thus would have to conduct verification sampling more than once. Before each round of verification sampling MSHA assumes that the operators would need to revise their ventilation plan. The number of MMUs affected in underground coal mines by mine size category are:

- 211 MMUs in mines employing fewer than 20 workers,
- 691 MMUs in non-longwall mines employing 20 to 500 workers,
- 45 MMUs, in longwall mines employing 20 to 500 workers,
- 30 MMUs in non-longwall mines employing more than 500 workers,
- and 7 MMUs in longwall mines employing more than 500 workers.

During the first year of the PV rule, after operators have verified their ventilation plan, some operators would experience a sample result that shows an overexposure. MMUs in this situation would need to re-verify the mine ventilation plan. The number of MMUs estimated to need to re-verify in the first year of the PV rule and thus revise their written ventilation plans are:

- 15 MMUs in mines employing fewer than 20 workers,
- 49 MMUs in non-longwall mines employing 20 to 500 workers,
- 6 MMUs, in longwall mines employing 20 to 500 workers,
- 1 MMU in a non-longwall mine employing more than 500 workers,
- and 1 MMU in a longwall mines employing more than 500 workers.

Table VII-8 shows operators' first year burden hours and costs for writing revised ventilation plans.

Table VII-9 shows operators' first year burden hours and costs for writing revised ventilation plans for operators that must re-verify ventilation plans.

Table VII-10 combines all first year burden hours and costs to show the total adjusted first year and annualized figures for operators to revise ventilation plans.

Table VII-8: Existing 75.370 Pursuant to Proposed 70.203(a)
First Year Burden Hours and Costs to Write Revised Ventilation Plan

Burden Hours						
Ug. Coal Mine Size	MMUs	Time to Write Plan (hrs.)	1st Round	2nd Round ^a	3rd Round ^a	First Year Hours
<20 emp.	211	5	1,055	264	18	1,337
>20 emp. <500 no lgwl	691	6	4,146	1,037	73	5,255
>20 emp. <500 lgwl	45	6	270	178	134	582
Sub-total	736		4,416	1,215	206	5,837
>500 emp. no lgwl	30	7	210	53	4	266
>500 emp. lgwl	7	7	49	29	22	100
Sub-total	37		259	82	26	367
First Year Hours			5,730	1,560	250	7,541
Burden Costs						
Mine Size	Superv. Wage Rate	1st Round Costs ^b	2nd Round Costs ^b	3rd Round Costs ^b	First Year Costs	
<20 emp.	\$49.79	\$52,528	\$13,132	\$919	\$66,580	
>20 emp. <500 no lgwl	\$49.79	\$206,429	\$51,607	\$3,613	\$261,649	
>20 emp. <500 lgwl	\$49.79	\$13,443	\$8,873	\$6,654	\$28,970	
Sub-total		\$219,873	\$60,480	\$10,267	\$290,619	
>500 emp. no lgwl	\$49.79	\$10,456	\$2,614	\$183	\$13,253	
>500 emp. lgwl	\$49.79	\$2,440	\$1,464	\$1,098	\$5,001	
Sub-total		\$12,896	\$4,078	\$1,281	\$18,254	
First Year Costs		\$285,297	\$77,690	\$12,467	\$375,454	

^a First Year Hours = multiply "1st Round" Hours by percentages in Table IV-17.

^b First Year Costs = Relevant First Year Hours x Supervisor's Wage Rate.

Table VII-9: Existing 75.370 Pursuant to Proposed 70.203(a)
First Year Burden Hours and Costs to Write Revised Ventilation Plan
(For Those MMUs That Must Re-Verify Ventilation Plans)

Burden Hours			
Ug. Coal Mine Size	MMUs	Time to Write Plan (hrs.)	First Year Hours ^a
<20 emp.	15	5	75
>20 emp. <500 no lgwl	49	6	294
>20 emp. <500 lgwl	6	6	36
Sub-total	55		330
>500 emp. no lgwl	1	7	7
>500 emp. lgwl	1	7	7
Sub-total	2		14
First Year Hours			419
Burden Costs			
Mine Size	Superv. Wage Rate	First Year Burden Costs ^b	
<20 emp.	\$49.79	\$3,734	
>20 emp. <500 no lgwl	\$49.79	\$14,638	
>20 emp. <500 lgwl	\$49.79	\$1,792	
Sub-total		\$16,431	
>500 emp. no lgwl	\$49.79	\$349	
>500 emp. lgwl	\$49.79	\$349	
Sub-total		\$697	
First Year Costs			\$20,862

^a First Year Hours = MMUs x Time to Write Plan.

^b First Year Costs = First Year Hours x Supervisor's Wage Rate.

Table VII-10: Existing 75.370 Pursuant to Proposed 70.203(a)
Total First Year Burden Hours and Costs to Write Revised Ventilation Plan

Burden Hours			
Ug. Coal Mine Size	First Year Hours ^a	Annual Hours ^b	Adjusted First Year Hours ^c
<20 emp.	1,412	265	1,147
>20 emp. <500 no lgwl	5,549	1,038	4,511
>20 emp. <500 lgwl	618	66	552
Sub-total	6,167	1,104	5,063
>500 emp. no lgwl	273	56	217
>500 emp. lgwl	107	14	93
Sub-total	381	70	311
Total First Year Hours	7,960	1,439	6,521

Burden Costs				
Mine Size	First Year Costs ^d	Annual Costs ^e	Adjusted First Year Costs ^f	Adjusted First Year Costs Annualized ^g
<20 emp.	\$70,314	\$13,194	\$57,120	\$3,998
>20 emp. <500 no lgwl	\$276,287	\$51,682	\$224,605	\$15,722
>20 emp. <500 lgwl	\$30,763	\$3,286	\$27,477	\$1,923
Sub-total	\$307,050	\$54,968	\$252,082	\$17,646
>500 emp. no lgwl	\$13,601	\$2,788	\$10,813	\$757
>500 emp. lgwl	\$5,350	\$697	\$4,653	\$326
Sub-total	\$18,951	\$3,485	\$15,466	\$1,083
Total First Year Costs	\$396,316	\$71,648	\$324,668	\$22,727

^a Addition of First Year Hours from Tables VII-8 and VII-9.

^b An equivalent amount of annual hours from Table VII-11.

^c First Year Hours minus Annual Hours.

^d Addition of First Year Costs from Tables VII-8 and VII-9.

^e An equivalent amount of annual costs from Table VII-11.

^f First Year Costs minus Annual Costs.

^g Adjusted First Year Costs x 0.07, where 0.07 is the annualization factor.

Existing § 75.370 Pursuant to Proposed § 70.203(a)
Underground Coal Mine Operators' Annual Burden Hours and
Costs to Revise Ventilation Plans

On an annual basis, MSHA assumes that 25% of all underground coal mine operators, in each mine size category, would need to revise their mine ventilation plans. MSHA estimates that each MMU would generate a revision to the mine ventilation plan that would take a mine supervisor about: 5 hours for mines employing fewer than 20 workers, 6 hours for mines employing 20 to 500 workers, and 7 hours for mines employing more than 500 workers.

The number of MMUs affected in underground coal mines by mine size category are:

- 53 MMUs in mines employing fewer than 20 workers,
- 173 MMUs in non-longwall mines employing 20 to 500 workers,
- 11 MMUs, in longwall mines employing 20 to 500 workers,
- 8 MMUs in non-longwall mines employing more than 500 workers,
- and 2 MMUs in longwall mines employing more than 500 workers.

The annual burden hours and costs are presented in Table VII-11.

Table VII-11
annual burden hours and costs

Existing § 75.370(a)(2)&(a)(3)(i)
Underground Coal Mine Operators' First Year Burden Hours and
Costs to Prepare and Send Revised Ventilation Plans to
MSHA's District Manager and to the Miners' Representative.

Initially, all underground coal mine operators that revise ventilation plans would need to send copies of the plans to the appropriate MSHA District Manager and to the miners' representative.

MSHA assumes a clerical worker would take 0.1666 hours (10 minutes) for each MMU sampled in order to prepare and send in a revised ventilation plan. On average, the length of a ventilation plan is estimated to be about 3 pages for an operator employing fewer than 20 workers, and about 6 pages for an operator employing 20 or more workers. Costs for photocopying are not included in the calculation below as a paperwork burden.

As noted earlier, not all operators would successfully verify their ventilation plans after the first round of verification sampling. Thus, paperwork costs are included in the table below for the additional times that operators would send in revised ventilation plans. The number of MMUs affected in underground coal mines by mine size category are:

- 211 MMUs in mines employing fewer than 20 workers,
- 691 MMUs in non-longwall mines employing 20 to 500 workers,
- 45 MMUs in longwall mines employing 20 to 500 workers,
- 30 MMUs in non-longwall mines employing more than 500 workers,
- and 7 MMUs in longwall mines employing more than 500 workers.

The number of MMUs estimated to need to re-verify in the first year of the PV rule and thus prepare and send revised ventilation plans to MSHA's District Manager and to the miner representative are:

- 15 MMUs in mines employing fewer than 20 workers,
- 49 MMUs in non-longwall mines employing 20 to 500 workers,
- 6 MMUs, in longwall mines employing 20 to 500 workers,
- 1 MMU in a non-longwall mine employing more than 500 workers,
- and 1 MMU in a longwall mines employing more than 500 workers.

Table VII-12 shows operators' first year burden hours and costs to send in revised ventilation plans.

Table VII-13 shows operators' first year burden hours and costs to send in revised ventilation plans for operators that must re-verify ventilation plans.

Table VII-14 combines all first year burden hours and costs to show the total adjusted first year and annualized figures for operators to send in revised ventilation plans.

Table VII-12: Existing 75.370(a)(2) & (a)(3)(i)
First Year Burden Hours and Costs to Send Revised Ventilation Plan

Burden Hours							
Ug. Coal Mine Size	MMUs	Time to Prepare & Send (hrs.)	Copies to Mail	1st Round	2nd Round ^a	3rd Round ^a	First Year Hours
<20 emp.	211	0.1666	2	70.31	17.58	1.23	89
>20 emp. <500 no lgwl	691	0.1666	2	230.24	57.56	4.03	292
>20 emp. <500 lgwl	45	0.1666	2	14.99	9.90	7.42	32
Sub-total	736			245.24	67.46	11.45	324
>500 emp. no lgwl	30	0.1666	2	10.00	2.50	0.17	13
>500 emp. lgwl	7	0.1666	2	2.33	1.40	1.05	5
Sub-total	37			12.33	3.90	1.22	17
First Year Hours				327.87	88.93	13.91	431
Burden Costs							
Mine Size	Clerical Wage Rate			1st Try ^b	2nd Try ^b	3rd Try ^b	First Year Costs
<20 emp.	\$18.56			\$1,305	\$326	\$23	\$1,654
>20 emp. <500 no lgwl	\$18.56			\$4,273	\$1,068	\$75	\$5,416
>20 emp. <500 lgwl	\$18.56			\$278	\$184	\$138	\$600
Sub-total				\$4,552	\$1,252	\$213	\$6,016
>500 emp. no lgwl	\$18.56			\$186	\$46	\$3	\$235
>500 emp. lgwl	\$18.56			\$43	\$26	\$19	\$89
Sub-total				\$229	\$72	\$23	\$324
First Year Costs				\$6,085	\$1,651	\$258	\$7,994

^a First Year Hours = multiply "1st Round" Hours by percentages in Table IV-17.

^b First Year Costs = Relevant First Year Hours x Clerical Wage Rate.

Table VII-13: Existing 75.370(a)(2) & (a)(3)(i)
First Year Burden Hours and Costs to Send Revised Ventilation Plan
(For Those MMUs That Must Re-Verify Ventilation Plans)

Burden Hours				
Ug. Coal Mine Size	MMUs	Time to Prepare & Send (hrs.)	Copies to Mail	First Year Hours
<20 emp.	15	0.1666	2	5
>20 emp. <500 no lgwl	49	0.1666	2	16
>20 emp. <500 lgwl	6	0.1666	2	2
Sub-total	55			18
>500 emp. no lgwl	1	0.1666	2	0
>500 emp. lgwl	1	0.1666	2	0
Sub-total	2			1
First Year Hours			24	
Burden Costs				
Mine Size			Clerical Wage Rate	First Year Costs
<20 emp.			\$18.56	\$93
>20 emp. <500 no lgwl			\$18.56	\$303
>20 emp. <500 lgwl			\$18.56	\$37
Sub-total				\$340
>500 emp. no lgwl			\$18.56	\$6
>500 emp. lgwl			\$18.56	\$6
Sub-total				\$12
First Year Costs			\$445	

^a First Year Hours = MMUs x Time to Prepare & send x Copies to Mail .

^b First Year Costs = First Year Hours x Clerical Wage Rate.

Table VII-14: Existing 75.370 Pursuant to Proposed 70.203(a)
Total First Year Burden Hours and Costs to Send Revised Ventilation Plan

Burden Hours				
Ug. Coal Mine Size	First Year Hours ^a	Annual Hours ^b	Adjusted First Year Hours ^c	
<20 emp.	94	18	76	
>20 emp. <500 no lgwl	308	58	251	
>20 emp. <500 lgwl	34	4	31	
Sub-total	342	61	281	
>500 emp. no lgwl	13	3	10	
>500 emp. lgwl	5	1	4	
Sub-total	18	3	15	
Total First Year Hours	455	82	372	

Burden Costs				
Mine Size	First Year Costs ^d	Annual Costs ^e	Adjusted First Year Costs ^f	Adjusted First Year Costs Annualized ^g
<20 emp.	\$1,747	\$328	\$1,419	\$99
>20 emp. <500 no lgwl	\$5,719	\$1,070	\$4,650	\$325
>20 emp. <500 lgwl	\$637	\$68	\$569	\$40
Sub-total	\$6,356	\$1,138	\$5,218	\$365
>500 emp. no lgwl	\$241	\$49	\$192	\$13
>500 emp. lgwl	\$95	\$12	\$83	\$6
Sub-total	\$336	\$62	\$274	\$19
Total First Year Costs	\$8,439	\$1,527	\$6,912	\$484

^a Addition of First Year Hours from Tables VII-12 and VII-13.

^b An equivalent amount of annual hours from Table VII-15.

^c First Year Hours minus Annual Hours.

^d Addition of First Year Costs from Tables VII-12 and VII-13.

^e An equivalent amount of annual costs from Table VII-15.

^f First Year Costs minus Annual Costs.

^g Adjusted First Year Costs x 0.07, where 0.07 is the annualization factor.

Existing § 75.370(a)(2)&(a)(3)(i)
Underground Coal Mine Operators Annual Burden Hours and
Costs to Prepare and Send Revised Ventilation Plans to
MSHA's District Manager and to the Miners' Representative.

On an annual basis, MSHA assumes that 25% of all MMUs, in each mine size category, would need to revise their ventilation plan and therefore send to MSHA's District Manager and the miners' representative a copy of the revised ventilation plan.

MSHA assumes a clerical worker would take 0.1666 hours (10 minutes) for each MMU in order to prepare and send in a revised ventilation plan. On average, the length of a ventilation plan is estimated to be about 3 pages for an operator that employs fewer than 20 workers, and about 6 pages for an operator that employs 20 or more workers. Costs for photocopying are not included in the calculation below as a paperwork burden.

The number of MMUs affected in underground coal mines by mine size category are:

- 53 MMUs in mines employing fewer than 20 workers,
- 173 MMUs in non-longwall mines employing 20 to 500 workers,
- 11 MMUs in longwall mines employing 20 to 500 workers,
- 8 MMUs in non-longwall mines employing more than 500 workers,
- and 2 MMUs in longwall mines employing more than 500 workers.

The annual burden hours and costs are presented in Table VII-15.

Table VII-15: Existing 75.370(a)(2) & (a)(3)(i)

Total Annual Burden Hours and Costs to Prepare and Send Revised Ventilation Plan

Ug. Coal Mine Size	MMUs ^a	Time to Prepare & Send Plan (hrs.) ^b	Copies to Send	Annual Hours	Clerical Person Wage Rate (per hr.)	Annual Costs
<20 emp.	53	0.1666	2	18	\$18.56	\$328
>20 emp. <500 no lgwl	173	0.1666	2	58	\$18.56	\$1,070
>20 emp. <500 lgwl	11	0.1666	2	4	\$18.56	\$68
Sub-total	184			61		\$1,138
>500 emp. no lgwl	8	0.1666	2	3	\$18.56	\$49
>500 emp. lgwl	2	0.1666	2	1	\$18.56	\$12
Sub-total	10			3		\$62
Total Annual Hours & Costs				82		\$1,527

^a Numbers reflect 25% of all MMUs from Table VII-12.

Existing § 75.370(a)(3)(iii)
Underground Coal Mine Operators' First Year Burden Hours and
Costs to Post Revised Ventilation Plans

All underground coal mine operators would initially need to post the revised ventilation plan.

MSHA assumes a clerical worker would take 0.1666 hours (10 minutes) to copy and post a revised ventilation plan. On average, the length of a ventilation plan is estimated to be about 3 pages for an operator employing fewer than 20 workers and about 6 pages for an operator employing 20 or more workers. Photocopying costs are not included in the calculation below as a paperwork burden.

As noted earlier, not all operators would successfully verify their ventilation plans on the first round. Therefore, paperwork costs in the table below include the additional times that operators would post revised ventilation plans. The number of MMUs affected in underground coal mines by mine size category are:

- 211 MMUs in mines employing fewer than 20 workers,
- 691 MMUs in non-longwall mines employing 20 to 500 workers,
- 45 MMUs in longwall mines employing 20 to 500 workers,
- 30 MMUs in non-longwall mines employing more than 500 workers,
- and 7 MMUs in longwall mines employing more than 500 workers.

The number of MMUs estimated to need to re-verify in the first year of the PV rule and thus post revised ventilation plans are:

- 15 MMUs in mines employing fewer than 20 workers,
- 49 MMUs in non-longwall mines employing 20 to 500 workers,
- 6 MMUs, in longwall mines employing 20 to 500 workers,
- 1 MMU in a non-longwall mine employing more than 500 workers,
- and 1 MMU in a longwall mines employing more than 500 workers.

Table VII-16 shows operators' first year burden hours and costs to post revised ventilation plans.

Table VII-17 shows operators' first year burden hours and costs to post revised ventilation plans for operators that must re-verify ventilation plans.

Table VII-18 combines all first year burden hours and costs

to show the total adjusted first year and annualized figures for operators to post revised ventilation plans.

Table VII-16: Existing 75.370(a)(3)(iii)
First Year Burden Hours and Costs to Post Revised Ventilation Plan

Burden Hours						
Ug. Coal Mine Size	MMUs	Time to Post Plan (hrs.)	1st Round	2nd Round ^a	3rd Round ^a	First Year Hours
<20 emp.	211	0.1666	35.15	8.79	0.62	45
>20 emp. <500 no lgwl	691	0.1666	115.12	28.78	2.01	146
>20 emp. <500 lgwl	45	0.1666	7.50	4.95	3.71	16
Sub-total	736		122.62	33.73	5.73	162
>500 emp. no lgwl	30	0.1666	5.00	1.25	0.09	6
>500 emp. lgwl	7	0.1666	1.17	0.70	0.52	2
Sub-total	37		6.16	1.95	0.61	9
First Year Hours			163.93	44.47	6.95	215
Burden Costs						
Mine Size	Clerical Wage Rate	1st Try ^b	2nd Try ^b	3rd Try ^b	First Year Costs	
<20 emp.	\$18.56	\$652	\$163	\$11	\$827	
>20 emp. <500 no lgwl	\$18.56	\$2,137	\$534	\$37	\$2,708	
>20 emp. <500 lgwl	\$18.56	\$139	\$92	\$69	\$300	
Sub-total		\$2,276	\$626	\$106	\$3,008	
>500 emp. no lgwl	\$18.56	\$93	\$23	\$2	\$118	
>500 emp. lgwl	\$18.56	\$22	\$13	\$10	\$44	
Sub-total		\$114	\$36	\$11	\$162	
First Year Costs		\$3,043	\$825	\$129	\$3,997	

^a First Year Hours = multiply "1st Round" Hours by percentages in Table IV-17.

^b First Year Costs = Relevant First Year Hours x Clerical Wage Rate.

Table VII-17: Existing 75.370(a)(3)(iii)
First Year Burden Hours and Costs to Post Revised Ventilation Plan
(For Those MMUs That Must Re-Verify Ventilation Plans)

Burden Hours			
Ug. Coal Mine Size	MMUs	Time to Post Plan (hrs.)	First Year Hours
<20 emp.	15	0.1666	2
>20 emp. <500 no lgwl	49	0.1666	8
>20 emp. <500 lgwl	6	0.1666	1
Sub-total	55		9
>500 emp. no lgwl	1	0.1666	0
>500 emp. lgwl	1	0.1666	0
Sub-total	2		0
First Year Hours			12
Burden Costs			
Mine Size		Clerical Wage Rate	First Year Costs
<20 emp.		\$18.56	\$46
>20 emp. <500 no lgwl		\$18.56	\$152
>20 emp. <500 lgwl		\$18.56	\$19
Sub-total			\$170
>500 emp. no lgwl		\$18.56	\$3
>500 emp. lgwl		\$18.56	\$3
Sub-total			\$6
First Year Costs			\$223

^a First Year Hours = MMUs x Time to Post Plan.

^b First Year Costs = First Year Hours x Clerical Wage Rate.

Table VII-18: Existing 75.370 Pursuant to Proposed 70.203(a)
First Year Burden Hours and Costs to Post Revised Ventilation Plan

Burden Hours			
Ug. Coal Mine Size	First Year Hours ^a	Annual Hours ^b	Adjusted First Year Hours ^c
<20 emp.	47	9	38
>20 emp. <500 no lgwl	154	29	125
>20 emp. <500 lgwl	17	2	15
Sub-total	171	31	141
>500 emp. no lgwl	7	1	5
>500 emp. lgwl	3	0	2
Sub-total	9	2	7
Total First Year Hours	227	41	186

Burden Costs				
Mine Size	First Year Costs ^d	Annual Costs ^e	Adjusted First Year Costs ^f	Adjusted First Year Costs Annualized ^g
<20 emp.	\$873	\$164	\$709	\$50
>20 emp. <500 no lgwl	\$2,860	\$535	\$2,325	\$163
>20 emp. <500 lgwl	\$318	\$34	\$284	\$20
Sub-total	\$3,178	\$569	\$2,609	\$183
>500 emp. no lgwl	\$121	\$25	\$96	\$7
>500 emp. lgwl	\$47	\$6	\$41	\$3
Sub-total	\$168	\$31	\$137	\$10
Total First Year Costs	\$4,220	\$764	\$3,456	\$242

^a Addition of First Year Hours from Tables VII-16 and VII-17.

^b An equivalent amount of annual hours from Table VII-19.

^c First Year Hours minus Annual Hours.

^d Addition of First Year Costs from Tables VII-16 and VII-17.

^e An equivalent amount of annual costs from Table VII-19.

^f First Year Costs minus Annual Costs.

^g Adjusted First Year Costs x 0.07, where 0.07 is the annualization factor.

Existing § 75.370(a)(3)(iii)
Underground Coal Mine Operators' Annual Burden Hours and
Costs to Post Revised Ventilation Plans

On an annual basis, MSHA assumes that 25% of all MMUs, in each mine size category, would need to post revised mine ventilation plans.

MSHA assumes a clerical worker would take 0.1666 hours (10 minutes) for each MMU sampled in order to copy and post a revised ventilation plan. On average, the length of a ventilation plan is estimated to be about 3 pages for an operator employing fewer than 20 workers and about 6 pages for an operator employing 20 or more workers. Costs for photocopying are not included in the calculation below as a paperwork burden.

The number of MMUs affected in underground coal mines by mine size category are:

- 53 MMUs in mines employing fewer than 20 workers,
- 173 MMUs in non-longwall mines employing 20 to 500 workers,
- 11 MMUs in longwall mines employing 20 to 500 workers,
- 8 MMUs in non-longwall mines employing more than 500 workers,
- and 2 MMUs in longwall mines employing more than 500 workers.

The annual burden hours and costs related to posting revised ventilation plans are presented in Table VII-19.

Table VII-19: Existing 75.370(a)(3)(iii)
Total Annual Burden Hours and Costs to Post Revised Ventilation Plan

Ug. Coal Mine Size	MMUs ^a	Time to Post Plan (hrs.) ^b	Annual Hours	Clerical Person Wage Rate (per hr.)	Annual Costs
<20 emp.	53	0.1666	9	\$18.56	\$164
>20 emp. <500 no lgwl	173	0.1666	29	\$18.56	\$535
>20 emp. <500 lgwl	11	0.1666	2	\$18.56	\$34
Sub-total	184		31		\$569
>500 emp. no lgwl	8	0.1666	1.33	\$18.56	\$25
>500 emp. lgwl	2	0.1666	0.33	\$18.56	\$6
Sub-total	10		1.67		\$31
Total Annual Hours & Costs			41		\$764

^a Numbers reflect 25% of all MMUs (from Table VII-16).

Proposed § 70.220(a)

Underground Coal Mine Operators' First Year Burden Hours and Costs to Post Verification Sample Results

All verification sample results must be posted on the mine bulletin board. The posted verification sample results may be removed after the ventilation plan has been approved by the District Manager.

MSHA estimates that it would take a clerical worker about 0.1 hours (about 6 minutes) to copy and post the results. Photocopying costs are not included in this section as a paperwork burden. The number of sample results to be posted corresponds to the number of samples that were estimated earlier, and listed in Table IV-46 in Chapter IV of this document.

The number of MMUs in mines that are affected by this paperwork provision are:

- 211 MMUs in mines employing fewer than 20 workers;
- 691 MMUs in non-longwall mines employing 20 to 500 workers.
- 45 longwall MMUs in mines employing 20 to 500 workers;
- 30 non-longwall MMUs in mines employing more than 500 workers;
- and 7 longwall MMUs in mines employing more than 500 workers.

Table VII-20 shows operators' first year burden hours and costs to post sample results associated with verification sampling.

Table VII-21 shows operators' first year burden hours and costs to post sample results associated with verification sampling for operators that must re-verify ventilation plans.

Table VII-22 combines all first year burden hours and costs to show the total adjusted first year and annualized figures to post sample results associated with verification sampling.

Table VII-20: Existing 70.220(a)
First Year Burden Hours and Costs to Post Verification Sample Results

Burden Hours									
Ug. Coal Mine Size	MMUs	Time to Post Results (hrs.)	No. of Results Posted 1st Round ^a	No. of Results Posted 2nd Round ^a	No. of Results Posted 2nd Round ^a	1st Round ^b	2nd Round ^c	3rd Round ^d	First Year Hours
<20 emp.	211	0.1	4.47	3	3	94.32	15.83	4.43	115
>20 emp. <500 no lgwl	691	0.1	4.47	3	3	308.88	51.83	14.51	375
>20 emp. <500 lgwl	45	0.1	5.96	4	5	26.82	11.88	16.88	56
Sub-total	736					335.70	63.71	31.39	431
>500 emp. no lgwl	30	0.1	4.47	3	3	13.41	2.25	0.63	16
>500 emp. lgwl	7	0.1	5.96	4	5	4.17	1.68	2.63	8
Sub-total	37					17.58	3.93	3.26	25
First Year Hours						447.60	83.46	39.07	570
Burden Costs									
Mine Size	Clerical Wage Rates					1st Try ^e	2nd Try ^e	3rd Try ^e	First Year Costs
<20 emp.	\$18.56					\$1,751	\$294	\$82	\$2,126
>20 emp. <500 no lgwl	\$18.56					\$5,733	\$962	\$269	\$6,964
>20 emp. <500 lgwl	\$18.56					\$498	\$220	\$313	\$1,031
Sub-total						\$6,231	\$1,182	\$583	\$7,995
>500 emp. no lgwl	\$18.56					\$249	\$42	\$12	\$302
>500 emp. lgwl	\$18.56					\$77	\$31	\$49	\$157
Sub-total						\$326	\$73	\$60	\$460
First Year Costs						\$8,307	\$1,549	\$725	\$10,582

^a No. of sample results posted equals to number of samples from Table IV-46.

^b Formula = ug. mines x time to post x no. of results posted on 1st Round.

^c For all non-longwall mines hours =
 (no. of ug. mines x 0.25 failure rate) x time to post x no. of posting on 2nd Round.
 For longwall mines with ≥ 20 emp. ≤ 500 =
 (no. of ug. mines x 0.66 failure rate) x time to post x no. of posting on 2nd Round.
 For longwall mines with > 500 emp. =
 (no. of ug. mines x 0.60 failure rate) x time to post x no. of posting on 2nd Round.

^d For all non-longwall mines hours =
 (no. of ug. mines x 0.07 failure rate) x time to post x no. of posting on 3rd Round.
 For all longwall mines hours =
 (no. of ug. mines x 0.75 failure rate) x time to post x no. of posting on 3rd Round.

^e First Year Costs = Relevant First Year Hours x Clerical Wage Rate.

Table VII-21: Existing 70.220(a)
First Year Burden Hours and Costs to Post Verification Sample Results
(For Those MMUs That Must Re-Verify Ventilation Plans)

Burden Hours				
Ug. Coal Mine Size	MMUs	Time to Post Results (hrs.)	No. of Results to Post ^a	First Year Hours
<20 emp.	15	0.1	4.47	7
>20 emp. <500 no lgwl	49	0.1	4.47	22
>20 emp. <500 lgwl	6	0.1	5.96	4
Sub-total	55			25
>500 emp. no lgwl	1	0.1	4.47	0
>500 emp. lgwl	1	0.1	5.96	1
Sub-total	2			1
First Year Hours				33
Burden Costs				
Mine Size		Superv. Wage Rates	First Year Costs	
<20 emp.		\$18.56	\$124	
>20 emp. <500 no lgwl		\$18.56	\$407	
>20 emp. <500 lgwl		\$18.56	\$66	
Sub-total			\$473	
>500 emp. no lgwl		\$18.56	\$8	
>500 emp. lgwl		\$18.56	\$11	
Sub-total			\$19	
First Year Costs			\$617	

^a No. of sample results posted equals to number of samples from Table IV-46.

Table VII-22: Existing 70.220(a)
Total First Year Burden Hours and Costs to Post Verification Sample Results

Burden Hours			
Ug. Coal Mine Size	First Year Hours ^a	Annual Hours ^b	Adjusted First Year Hours ^c
<20 emp.	121	24	98
>20 emp. <500 no lgwl	397	77	320
>20 emp. <500 lgwl	59	7	53
Sub-total	456	84	372
>500 emp. no lgwl	17	4	13
>500 emp. lgwl	9	1	8
Sub-total	26	5	21
Total First Year Hours	603	112	491

Burden Costs				
Mine Size	First Year Costs ^d	Annual Costs ^e	Adjusted First Year Costs ^f	Adjusted First Year Costs Annualized ^g
<20 emp.	\$2,251	\$440	\$1,811	\$127
>20 emp. <500 no lgwl	\$7,370	\$1,435	\$5,935	\$415
>20 emp. <500 lgwl	\$1,098	\$122	\$976	\$68
Sub-total	\$8,468	\$1,557	\$6,911	\$484
>500 emp. no lgwl	\$311	\$66	\$244	\$17
>500 emp. lgwl	\$168	\$22	\$146	\$10
Sub-total	\$479	\$88	\$391	\$27
Total First Year Costs	\$11,198	\$2,085	\$9,113	\$638

^a Addition of First Year Hours from Tables VII-20 and VII-21.

^b An equivalent amount of annual hours from Table VII-23.

^c First Year Hours minus Annual Hours.

^d Addition of First Year Costs from Tables VII-20 and VII-21.

^e An equivalent amount of annual costs from Table VII-23.

^f First Year Costs minus Annual Costs.

^g Adjusted First Year Costs x 0.07, where 0.07 is the annualization factor.

Proposed § 70.220(a)
Underground Coal Mine Operators' Annual Burden Hours and
Costs to Post Verification Sample Results

The 25 percent of all MMUs, in each mine size, that would need verification sampling on an annual basis would also need to post the sample results.

MSHA estimates that it would take a clerical worker about 0.01 hours (about 6 minutes) to copy and post the results. Photocopying costs are not included in this section as a paperwork burden. The number of sample results to be posted corresponds to the number of samples that were estimated earlier, and listed in Table IV-46 in chapter IV of this document.

The number of MMUs in mines that are affected by this paperwork provision are:

- 53 MMUs in mines employing fewer than 20 workers;
- 173 MMUs in non-longwall mines employing 20 to 500 workers.
- 11 longwall MMUs in mines employing 20 to 500 workers;
- 8 non-longwall MMUs in mines employing more than 500 workers;
- and 2 longwall MMUs in mines employing more than 500 workers.

Table VII-23 below shows the annual burden hours and costs for operators to post sample results associated with verification sampling.

Table VII-23: Proposed 70.216(a)

Total Annual Burden Hours and Costs to Post Verification Sample Results

Ug. Coal Mine Size	MMUs	Time to Post (hrs.)	No. of Results to Post ^a	Annual Burden Hours	Clerical Hourly Wage Rate	Annual Costs
<20 emp.	53	0.1	4.47	24	\$18.56	\$440
>20 emp. <500 no lgwl	173	0.1	4.47	77	\$18.56	\$1,435
>20 emp. <500 lgwl	11	0.1	5.96	7	\$18.56	\$122
Sub-total	184			84		\$1,557
>500 emp. no lgwl	8	0.1	4.47	4	\$18.56	\$66
>500 emp. lgwl	2	0.1	5.96	1	\$18.56	\$22
Sub-total	10			5		\$88
Annual Hours & Costs				112		\$2,085

^a No. of sample results posted equals to number of samples from Table IV-46.

Proposed §§ 70.211(b) and 70.212(b)
Affected Underground Coal Mine Longwall Operators' First
Year Burden Hours and Costs to Request MSHA Determination
That Would Permit the Use of PAPRs and to Write A PAPR
Program

A longwall operator can request in writing that MSHA determine if the operator has used all feasible engineering or environmental controls to reduce concentrations of respirable dust to as low as level as possible. If MSHA makes a determination that the operator has used all available controls and could still not obtain a verified ventilation plan, then the operator can use administrative controls or powered air-purifying respirators (PAPRs) until other feasible engineering or environmental controls become available.

There are no longwalls in mines employing fewer than 20 workers. There are 45 longwall MMUs in mines employing 20 to 500 workers, of which 22 would need a third round of verification sampling. Of the 22 longwall MMUs, MSHA assumes that 75 percent, or 17 MMUs, would have miners that could use PAPRs before conducting a third round of verification sampling. There are 3 longwall MMUs in mines employing more than 500 workers that would need a third round of verification sampling. MSHA assumes that these 3 longwall MMUs would have miners that could use PAPRs before conducting a third round of verification sampling.

Therefore, 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers would need: (1) to prepare materials and write MSHA requesting determination that all feasible engineering controls have been used and thus PAPRs can be used; and (2) to write a PAPR program.

MSHA estimates that it would take a supervisor, earning \$49.79 per hour, 4 hours to prepare the material and request in writing that MSHA determine whether or not all feasible engineering or environmental controls have been used. In addition, the supervisor is estimated to spend about 6 hours to write a program to govern the use of PAPRs in accordance with 30 CFR § 72.710. A clerical workers, earning \$18.56 per hour, is estimated to spend about 0.5 hours typing the above material. MSHA expects that the PAPR program would change only infrequently, approximately every 10 years on average. The first year costs for writing a PAPR program were therefore annualized using an annualization factor of 0.142, which reflects an investment period of 10 years and an annual discount rate of 7 percent.

Table VII-24 shows first year burden hours and first year burden hours and costs to write a PAPR program.

Table VII-24: Proposed 70.211(b) and 70.212(b)
Total First Year and Annualized Hours and Costs to Request MSHA Determination and
to Write a Program for the Use of PAPRs as Required under the Proposed PV Rule

Ug. Coal Longwall Mine Size	MMUs	Time per MMU (hrs.) ^a	First Year Burden Hours	Weighted Superv. & Clerical Wage Rate ^b	First Year Costs	Annualized Costs ^c
<20 emp.	0	10.5	0	\$48.30	\$0	\$0
>20 emp. <500 lgwl	17	10.5	179	\$48.30	\$8,622	\$1,224
>500 emp. lgwl	3	10.5	32	\$48.30	\$1,522	\$216
Total Hours & Costs			210		\$10,144	\$1,440

^a 10.5 hrs. = 4 hrs. to prepare and request MSHA determination, 6 hrs. to write PAPR program,
0.5 hrs. for clerical worker to type material.

^b \$48.30 = ((10hrs./10.5hrs.) x \$49.79) + ((0.5hrs./10.5hrs) x \$18.56).

^c Annualized Costs = First Year Costs x 0.142, where 0.142 is the annualization factor.

Proposed §§ 70.211(b) and 70.216(a)
Affected Underground Coal Mine Longwall Operators' First
Year Burden Hours and Costs to Request MSHA Determination
That Would Permit the Use of Administrative Controls and to
Write a Program For the Use of Administrative Controls

A longwall operator can request in writing that MSHA determine if the operator has used all feasible engineering or environmental controls to reduce concentrations of respirable dust to as low as level as possible. If MSHA makes a determination that the operator has used all available controls and could still not obtain a verified ventilation plan, then the operator has the option to use either administrative controls or powered air-purifying respirators (PAPRs), until other feasible engineering or environmental controls become available.

No MMUs in mines employing fewer than 20 workers or longwall operators employing more than 500 workers are assumed to use administrative controls. However, there are 5 longwall MMUs in mines employing 20 to 500 workers that are assumed to use administrative controls. These 5 longwall MMUs would need: (1) to prepare materials and write to MSHA requesting determination that all feasible engineering controls have been used and thus administrative controls can be used; and (2) to write an administrative control program.

MSHA estimates that it would take a supervisor about 4 hours to prepare the material and request in writing that MSHA determine whether or not all feasible engineering or environmental controls have been used. In addition, the supervisor would spend about another 2 hours to write such a program. The program would include basic elements for using and maintaining an administrative program. A clerical worker, earning \$18.56 per hour, is estimated to spend 0.5 hours typing the above material. The above material is assumed to be sent when submitting the revised ventilation plan. MSHA expects that the administrative program would change only infrequently, approximately every 10 years on average. The first year costs associated with writing an administrative program were therefore annualized using an annualization factor of 0.142, which reflects an investment period of 10 years and an annual discount rate of 7 percent.

Table IV-25 shows first year burden hours and costs to affected longwall operators to write a program governing the use of administrative controls.

Table VII-25: Proposed 70.211(b) and 70.216(a)
Total First Year Burden Hours and Costs to Request MSHA Determination and
to Write a Program for the Use of Administrative Controls

Ug. Coal Longwall Mine Size	MMUs	Time per MMU (hrs.)	First Year Burden Hours	Weighted Superv. & Clerical Wage Rate ^b	First Year Costs	Annualized Costs ^a
<20 emp.	0	6.5	0	\$47.39	\$0	\$0
>20 emp. <500 lgwl	5	6.5	33	\$47.39	\$1,540	\$219
>500 emp. lgwl	0	6.5	0	\$47.39	\$0	\$0
Total Hours & Costs			33		\$1,540	\$219

^a \$47.39 = ((6hrs./6.5hrs.) x \$49.79) + ((0.5hrs./6.5hrs) x \$18.56), where 6.5 hours equals 4 hrs. to prepare and request MSHA determination, 2 hrs. to write an administrative control program, and 0.5 hrs. for clerical worker to type material.

^b Annualized Costs = First Year Costs x 0.142, where 0.142 is the annualization factor.

Proposed § 70.212(b)

Underground Coal Mine Longwall Operators' First Year Burden
Hours and Costs for Supervisor to Prepare for Training
Miners on the Use of a PAPR

Training workers in the use of PAPRs is part of a PAPR written program. There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers that are assumed to have miners that would use PAPRs.

MSHA assumes that a mine supervisor would give the PAPR training, and it would take about 2 hours to prepare such a training program. This initial training is given once to all affected miners and does not have to be repeated, except for new employees. When it is repeated for new employees the preparation by the supervisor does not have to be repeated. Thus, the first year costs for the supervisor to prepare for PAPR training is annualized by using an annualization factor of 0.07.

Table IV-26 shows first year burden hours and costs for a supervisor to prepare for training miners in the use of PAPRs.

Table VII-26: Proposed 70.212(b)
Total First Year Burden Hours and Costs for Supervisor to Prepare for
Training Miners in the use of PAPRs

Ug. Coal Longwall Mine Size	MMUs	Time to Prepare Program (hrs.)	First Year Burden Hours	Superv. Wage Rate	First Year Costs	Annualized Costs ^a
<20 emp.	0	2	0	\$49.79	\$0	\$0
>20 emp. <500 lgwl	17	2	34	\$49.79	\$1,693	\$119
>500 emp. lgwl	3	2	6	\$49.79	\$299	\$21
Total Hours & Costs			40		\$1,992	\$139

^a Annualized Costs = First Year Costs x 0.07, where 0.07 is the annualization factor.

Proposed § 70.212(b)

Underground Coal Mine Longwall Operators' First Year Burden Hours and Costs for Supervisor to Train Miners on the Use of a PAPR

This PAPR initial training by the supervisor is given once to all affected miners and is only repeated for new employees. MSHA estimates that a mine supervisor would take about 30 minutes (0.5 hours) per shift to give PAPR training to miners.

A longwall mine is assumed to have 3 production shifts and each shift is composed of 5 miners who would need PAPR training. Thus, for PAPR training purposes, a mine supervisor needs to spend 0.5 hours for each of the 3 shifts per affected longwall mine.

There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall mines employing more than 500 workers that need to provide PAPR training.

Table IV-27 shows first year burden hours and costs for a longwall operators to train miners in the use of PAPRs.

Table VII-27: Proposed 70.212(b)
Total First Year Burden Hours and Costs for Supervisors to Train Miners
in the use of a PAPR

Ug. Coal Longwall Mine Size	MMUs	Superv. Training Time (hrs.) ^a	First Year Burden Hours	Superv. Wage Rate	First Year Costs	Annual- ized Costs ^b
<20 emp.	0	1.5	0	\$49.79	\$0	\$0
>20 emp. ≤500 lgwl	17	1.5	26	\$49.79	\$1,270	\$89
>500 emp. lgwl	3	1.5	5	\$49.79	\$224	\$16
Total Hours & Costs			30		\$1,494	\$105

^a 1.5 hours = supervisor's training time per MMU (takes 0.5 hrs. to train miners on each shift and training needed for 3 shifts)

^b Annualized Costs = First Year Costs x 0.07, where 0.07 is the annualization factor.

Proposed § 70.212(b)
Underground Coal Mine Longwall Operators' Annual Burden
Hours and Costs for Supervisor to Train New Miners on the
Use of a PAPR

As a result of miner turnover, MSHA assumes that initial PAPR training would need to be repeated for new miners. Assuming an annual miner turnover rate of 7 percent, then for each longwall MMU, 7 percent of 15 miners (1 miner) would need PAPR training annually. Since all new miners are not hired at the same time this training would be given by the supervisor to each new miner that is hired.

MSHA estimates that a mine supervisor would take about 30 minutes (0.5 hours) to give PAPR training to a new miner.

Table IV-28 shows annual hours and costs for longwall operators to train new miners in the use of PAPRs.

Table VII-28: Proposed 70.212(b)
Total Annual Burden Hours and Costs for Supervisors to Train Miners
in the use of a PAPR

Ug. Coal Longwall Mine Size	MMUs	Superv. Training Time (hrs.) ^a	No. of New Miners to be Trained (per mine) ^b	Annual Burden Hours	Superv. Wage Rate	Annual Costs
<20 emp.	0	0.5	0	0	\$49.79	\$0
>20 emp. ≤500 lgwl	17	0.5	1	9	\$49.79	\$444
>500 emp. lgwl	3	0.5	1	2	\$49.79	\$78
Total Hours & Costs				11		\$523

^a 0.5 hours = supervisor's time to train each miner

^b 1 = (15 miners per MMU x 7 percent)

Proposed § 70.212(b)

Underground Coal Mine Longwall Operators' First Year Burden Hours and Costs to Permanently Mark Assigned PAPRs and Record The Date of Issuance

Each PAPR that is permanently assigned to an individual should be durably marked to indicate to whom it was assigned. In addition, the date of issuance should be recorded. There are 17 longwall MMUs in mines that employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers whose operators would need to mark PAPRs and record the date of issuance.

MSHA estimates that it would take a supervisor about 3 minutes (0.05 hours) to perform the above functions (1.5 minutes to mark the respirator and another 1.5 minutes to record date of issuance). As noted earlier, each affected longwall MMU would operate 3 shifts and have 5 persons per shift that would need to use a PAPR. Therefore, 15 persons would need to wear a PAPR for each longwall affected by this provision.

Table IV-29 shows first year burden hours and costs for longwall operators to permanently mark assigned PAPRs and record the date of issuance. Since the above functions are performed only once, for each miner, the first year burden costs are annualized by using an annualization factor of 0.07.

Table VII-29: Proposed 70.212(b)
Total First Year and Annualized Burden Hours and Costs for Longwall
Operators to Permanently Mark Assigned PAPRs and Record Their Date of Issuance

Ug. Coal Longwall Mine Size	MMUs	Time to Mark & Record (hrs.) ^a	No. of PAPRs to Mark & Record (per MMU) ^b	First Year Burden Hours	Superv. Wage Rate (per hr.)	First Year Costs	Annual- ized Costs ^c
<20 emp.	0	0.05	0	0	49.79	\$0	\$0
>20 emp. <500 lgwl	17	0.05	15	13	\$49.79	\$635	\$44
>500 emp. lgwl	3	0.05	15	2	\$49.79	\$112	\$8
Total Hours & Costs				15		\$747	\$52

^a 0.05 hr. = (0.025 hr. for marking + 0.025 hr. to record date of issuance)

^b 15 per MMU = (5 miners x 3 shifts)

^c Annualized Costs = First Year Costs x 0.07, where 0.07 is the annualization factor.

Proposed § 70.212(b)
Underground Coal Mine Longwall Operators' Annual Burden
Hours and Costs to Permanently Mark PAPRs Assigned to New
Miners and Record The Date of Issuance

On an annual basis for new miners, operators would need to mark PAPRs and record their date of issuance. As noted earlier, miners turnover rate was estimated to be approximately 7%. For each longwall MMU affected by this provision, the number of new miners would be 7 percent of 15 miners (1 miner per MMU).

There are 17 longwall MMUs in mines employing 20 to 500 workers and 3 longwall MMUs in mines employing more than 500 workers whose operators would need to mark PAPRs for new miners and record the date of issuance.

MSHA estimates that it would take a supervisor about 3 minutes (0.05 hours) to perform the above functions (1.5 minutes to mark the respirator and another 1.5 minutes to record date of issuance).

Table IV-30 shows annual burden hours and costs for longwall operators to permanently mark PAPRs assigned to new miners and record the date of issuance.

Table VII-30: Proposed 70.212(b)
Total Annual Burden Hours and Costs for Longwall Operators to Permanently
Mark PAPRs Assigned to New Miners and Record Their Date of Issuance

Ug. Coal Longwall Mine Size	MMUs	Time to Mark & Record (hrs.) ^a	No. of PAPRs to Mark & Record (per MMU) ^b	Annual Burden Hours	Superv. Wage Rate (per hr.)	Annual Costs
<20 emp.	0	0.05	0	0	\$49.79	\$0
>20 emp. ≤500 lgwl	17	0.05	1	1	\$49.79	\$44
>500 emp. lgwl	3	0.05	1	0	\$49.79	\$8
Total Hours & Costs				1		\$52

^a 0.05 hr. = (0.025 hr. for marking + 0.025 hr. to record date of issuance)

^b 1 = (15 miners per MMU x 7 percent)

Proposed § 70.212(b)
Underground Coal Mine Longwall Operators' Annual Burden
Hours and Costs to Inspect and Record Inspection Date of
PAPRs Held for Emergency Use

A PAPR that is not routinely used, but is kept ready for emergency use must be inspected at least monthly to ensure that it is in satisfactory working condition.

There are 17 longwall MMUs in mines employing 20 to 500 workers, and 3 longwall MMUs in mines employing more than 500 workers whose operators would have to inspect emergency PAPRs and then record the date of inspection each month.

MSHA estimates that it would take a miner about 15 minutes (0.25 hours) to inspect the emergency PAPRs and about 1.5 minutes (0.025 hours) to record the date of the inspection. Therefore, a total of 0.275 hours would be needed for inspection of a PAPR and for recording the date of inspection. As noted earlier, MSHA assumes that there are 3 PAPRs held for emergency use per affected longwall MMU.

Table IV-31 shows annual burden hours and costs for affected longwall operators to inspect and record the date of inspection of PAPRs that are kept for emergency use.

Table VII-31: Proposed 70.212(b)
Total Annual Burden Hours and Costs to Inspect and Record
Inspection Date of PAPRs Held for Emergency Use

Ug. Coal Longwall Mine Size	MMUs	Time to Inspect & Record (hrs.) ^a	No. of Emergency PAPRs to Inspect & Record (per MMU) ^b	No. of Inspection & Records (per Yr.) ^c	Annual Burden Hours	Miner Wage Rate (per hr.)	Annual Year Costs
<20 emp.	0	0.275	0	0	0	\$26.83	\$0
>20 emp. <500 lgwl	17	0.275	3	12	168	\$26.83	\$4,515
>500 emp. lgwl	3	0.275	3	12	30	\$26.83	\$797
Total Hours & Costs					198		\$5,312

^a 0.275 hr. = (0.25 hr. for inspection +0.025 hr. to record inspection date)

^b 3 = no. of PAPRs kept for emergency use per MMU

^c 12 = (1 inspection x 12 months)

Table VII-32 provides a summary of the preceding paperwork provisions involving increased first year burden hours and related costs for the proposed PV rule. Table VII-33 provides a summary of the preceding paperwork provisions involving increased annual burden hours and related costs for the proposed PV rule.

Table VII-32:
Summary of Adjusted First Year and Annualized Increased Paperwork Burden Hours and Costs
Related to the Plan Verification Rule For Underground Coal Mine Operators *

Paperwork Provisions	Section	Employ <20			Employ >20<500			Employ >500			Total		
		Adjusted Burden Hours	Adjusted First Year Costs	Annualized Costs	Adjusted Burden Hours	Adjusted First Year Costs	Annualized Costs	Adjusted Burden Hours	Adjusted First Year Costs	Annualized Costs	Adjusted Burden Hours	Adjusted First Year Costs	Annualized Costs
Write Rev. Vent. Plan	75.370/70.203(a)	1,147	\$57,120	\$3,998	5,063	\$252,082	\$17,646	311	\$15,466	\$1,083	6,521	\$324,668	\$22,727
Prepare & Send Plan	75.370(a)(2)&(3)	76	\$1,419	\$99	281	\$5,218	\$365	15	\$274	\$19	372	\$6,912	\$484
Post Revised Plan	75.370(a)(3)(iii)	38	\$709	\$50	141	\$2,609	\$183	7	\$137	\$10	186	\$3,456	\$242
Post Sample Results	70.220(a)	98	\$1,811	\$127	372	\$6,911	\$484	21	\$391	\$27	491	\$9,113	\$638
Write PAPR Program	70.212(b)	0	\$0	\$0	179	\$8,622	\$1,224	32	\$1,522	\$216	210	\$10,144	\$1,440
Write Adm. Contrl. Prog.	70.232(a)(1)	0	\$0	\$0	33	\$1,540	\$219	0	\$0	\$0	33	\$1,540	\$219
Prepare for Training	70.212(b)	0	\$0	\$0	34	\$1,693	\$119	6	\$299	\$21	40	\$1,992	\$139
Give PAPR Training	70.212(b)	0	\$0	\$0	26	\$1,270	\$89	5	\$224	\$16	30	\$1,494	\$105
Mark & Record PAPRs	70.212(b)	0	\$0	\$0	13	\$635	\$44	2	\$112	\$8	15	\$747	\$52
Adjusted 1st Year PV Paperwork		1,359	\$61,059	\$4,274	6,140	\$280,581	\$20,372	398	\$18,425	\$1,399	7,898	\$360,064	\$26,046

* Source: Tables VII-8, VII-9, VII-10, VII-12, VII-13, VII-14, VII-16, VII-17, VII-18,

Table IV-33:
Summary of Annual Paperwork Burden Hours and Costs
For Plan Verification Rule For Underground Coal Mine Operators *

Paperwork Provisions	Section	Employ <20		Employ >20&<500		Employ >500		Total	
		Burden Hours	Annual Costs	Burden Hours	Annual Costs	Burden Hours	Annual Costs	Burden Hours	Annual Costs
Write Rev. Vent. Plan	75.370/70.203(a)	265	\$13,194	1,104	\$54,968	70	\$3,485	1,439	71,648
Prepare & Send Plan	75.370(a)(2)&(3)	18	\$328	61	\$1,138	3	\$62	82	\$1,527
Post Revised Plan	75.370(a)(3)(iii)	9	\$164	31	\$569	2	\$31	41	\$764
Post Sample Results	70.220(a)	24	\$440	84	\$1,557	5	\$88	112	\$2,085
Inspect Emerg. PAPRs	70.212(b)	0	\$0	168	\$4,515	30	\$797	198	5,312
Give PAPR Training	70.212(b)	0	\$0	9	\$444	2	\$78	11	\$523
Mark & Record PAPRs	70.212(b)	0	\$0	1	\$44	0	\$8	1	\$52
Annual PV Paperwork Beginning 1st Yr.		315	\$14,126	1,458	\$63,236	111	\$4,550	1,884	\$81,912

* Source: Tables VII-11, 15, 19, 23, 28, and 30 .

Existing §§ 70.201(d) & 90.201(d)
Annual Abatement Sampling Burden Hour and Cost Reductions
Related to the Reduced Number of Citations Issued Based on
MSHA Inspector Sample Results

The elimination of bi-monthly operator sampling would mean that abatement sampling related to citations issued from MSHA inspector samples would be the responsibility of MSHA inspectors instead of mine operators. Operators would derive cost savings from no longer performing such abatement sampling.

For each reduced citation, 5 abatement samples would be avoided. It is estimated to take about 1 hr. to take a sample. This hour is composed of 0.08333 hrs. for a certified dust technician to prepare, disassemble, and clean the sampler unit after sampling and 0.1666 hrs. for a mine supervisor to make the required operational checks during the sampling period. The sampling costs are estimated to be \$24.13 per sample $[(0.8333 \times \$19) + (0.1666 \times \$49.79)]$.

Reductions in paperwork burden hours are realized only for those mines that perform their own sampling with either their own or rented equipment. Thus, the following reductions in citations are estimated for each mine size category.

For underground coal mines:

- 182 of the 190 reduced citations in mines employing fewer than 20 workers (96% of these mines perform their own sampling);
- 462 of the 481 reduced citations in non-longwall mines employing 20 to 500 workers (96% of these mines perform their own sampling);
- 66 reduced citations in longwall mines employing 20 to 500 workers (100% of these mines perform their own sampling);
- 14 reduced citations in non-longwall mines employing more than 500 workers (100% of such mines perform their own sampling); and
- 6 reduced citations in longwall mines employing more than 500 workers (100% of these mines perform their own sampling).

Table VII-34 shows underground coal operators annual abatement sampling burden hour and cost reductions related to citations issued based on MSHA inspector sample results.

Table VII-34: Existing 70.201(d) & 90.201(d)

Annual Abatement Sampling Burden Hour and Cost Reductions Related to the
Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Citations	No. of Samples Per Citation	Sample Time (hr.)	Annual Reduced Hours	Cost Per Sample ^a	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	182	5	1	910	\$24.13	\$21,954
≥20 emp. ≤500 no lgwl	462	5	1	2,310	\$24.13	\$55,729
≥20 emp. ≤500 lgwl	66	5	1	330	\$24.13	\$7,961
Sub-Total	528			2,640		\$63,691
>500 emp. no lgwl	14	5	1	70	\$24.13	\$1,689
>500 emp. lgwl	6	5	1	30	\$24.13	\$724
Sub-Total	20			100		\$2,413
Annual Hours and Costs				3,650		\$88,057

^a \$24.13 = (0.8333 x \$19 wage) + (0.1666 hr. x \$49.79 wage)

Existing §§ 70.201(d) & 90.201(d)
Annual Burden Hour and Cost Reductions Related to Completing
Dust Cards Associated with Abatement Sampling Concerning the
Reduced Number of Citations Issued Based on MSHA Inspector
Sample Results

As a result of mine operators no longer performing abatement sampling in response to citations issued from MSHA inspector samples, the associated dust data cards would also no longer need to be completed.

After each abatement sample is taken, mine operators must complete and sign a dust data card that contains information about the sample. Five abatement samples are taken for each citation, and a dust data card must be completed for each sample taken. MSHA estimates that after each sample it would take 0.025 hours (about 1.5 minutes) for a mine safety inspector, or equivalent person, to complete and sign the dust data card. The mine safety inspector per hour wage rate is similar to a mine supervisor's wage rate of \$49.79. For the reduced citations the above costs would be avoided.

Reductions in paperwork burden hours are realized only for those mines that perform their own sampling with either their own or rented equipment. Thus, the following reductions in citations are estimated for each mine size category.

For underground coal mines:

- 182 of the 190 reduced citations in mines employing fewer than 20 workers (96% of these mines perform their own sampling);
- 462 of the 481 reduced citations in non-longwall mines employing 20 to 500 workers (96% of these mines perform their own sampling);
- 66 reduced citations in longwall mines employing 20 to 500 workers (100% of these mines perform their own sampling);
- 14 reduced citations in non-longwall mines employing more than 500 workers (100% of such mines perform their own sampling); and
- 6 reduced citations in longwall mines employing more than 500 workers (100% of these mines perform their own sampling).

Table VII-35 shows underground coal operators' burden hour and cost reductions related to completing dust cards.

Table VII-35: Existing 70.209(c) & 90.209(c)
Annual Burden Hour and Cost Reductions for Completing Dust Cards
Related to Abatement Sampling Related to the Reduced Number of
Citations Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Citations	No. of Samples Per Citation	Time For Card (hrs.)	Annual Reduced Hours	Technician Wage Rate (per hr.)	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	182	5	0.025	23	49.79	\$1,133
≥20 emp. ≤500 no lgwl	462	5	0.025	58	49.79	\$2,875
≥20 emp. ≤500 lgwl	66	5	0.025	8	49.79	\$411
Sub-Total	528			66		\$3,286
>500 emp. no lgwl	14	5	0.025	1.75	49.79	\$87
>500 emp. lgwl	6	5	0.025	0.75	49.79	\$37
Sub-Total	20			2.50		\$124
Annual Hours and Costs				91		\$4,543

Existing §§ 70.209(a) & 90.209(a)
Annual Burden Hour and Cost Reductions for Sending Abatement
Samples and Dust Cards to MSHA Concerning the Reduced Number
of Citations Issued Based on MSHA inspector Sample Results

As a result of mine operators no longer performing abatement sampling in response to citations issued based on MSHA inspector sample results, there would be cost savings to mine operators for not having to send to MSHA abatement samples and related dust data cards.

Five abatement samples are taken for each citation. Each abatement sample along with its dust data card is sent by a technician to an MSHA laboratory for analysis. MSHA estimates that it takes a certified dust technician 0.0833 hours to prepare and send in 1 sample along with the dust data card to MSHA. For the eliminated operator abatement sampling, the above costs would not be incurred. There are no burden hour decreases related to postage costs incurred to mail the samples; therefore they are not included in the calculation below as cost reductions related to burden hours.

Reductions in paperwork burden hours are realized only for those mines that perform their own sampling with either their own or rented equipment. Thus, the following reductions in citations are estimated for each mine size category.

For underground coal mines:

- 182 of the 190 reduced citations in mines employing fewer than 20 workers (96% of these mines perform their own sampling);
- 462 of the 481 reduced citations in non-longwall mines employing 20 to 500 workers (96% of these mines perform their own sampling);
- 66 reduced citations in longwall mines employing 20 to 500 workers (100% of these mines perform their own sampling);
- 14 reduced citations in non-longwall mines employing more than 500 workers (100% of such mines perform their own sampling);
- and 6 reduced citations in longwall mines, employing more than 500 workers (100% of these mines perform their own sampling).

Table VII-36 shows underground coal operators' burden hour and cost reductions for sending abatement samples and related dust cards to MSHA.

Table VII-36: Existing 70.209(a) & 70.209(a)

Annual Burden Hour and Cost Reductions to Send Abatement Samples
and Related Dust Cards to MSHA Related to the Reduced Number of
Citations Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Citations	No. of Samples Per Citation	Time to Send (hrs.)	Annual Reduced Hours	Technician Wage Rate (per hr.)	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	182	5	0.0833	76	\$19	\$1,440
≥20 emp. ≤500 no lgwl	462	5	0.0833	192	\$19	\$3,656
≥20 emp. ≤500 lgwl	66	5	0.0833	27	\$19	\$522
Sub-Total	528			220		\$4,178
>500 emp. no lgwl	14	5	0.0833	6	\$19	\$111
>500 emp. lgwl	6	5	0.0833	2	\$19	\$47
Sub-Total	20			8		\$158
Annual Hours and Costs				304		\$5,777

Existing § 90.300(a)
First Year Cost Reductions to Write a Respirable Dust
Control Program for Certain Types of Citations Related to
the Reduced Number of Citations Issued Based on MSHA
Inspector Sample Results

An operator must write and submit to MSHA a respirable dust control program after a part 90 citation has been abated. Under § 90.300(a), the mine operator must submit a written plan for the miner involved in the Part 90 citation. MSHA estimates that it would take a mine supervisor an average of 3 hours to write a plan. For the reduced citations the above costs would not occur.

During the first year, MSHA estimates:

- 3 reduced part 90 citations in underground mines employing 20 to 500 workers (2 in a non-longwall mine and 1 in a longwall mine).

Table VII-37 shows operators' first year hours and cost reductions associated with writing a dust plan concerning citations issued based on MSHA inspector sample results.

Table VII-38 shows operators' adjusted first year and annualized hour and cost reductions associated with writing a dust plan concerning citations issued based on MSHA inspector sample results.⁶³

⁶³ Note that the adjusted first year burden hour and cost reductions are negative numbers. This is because, even though the first year burden and cost reductions are positive, they are less than the annual burden and cost reductions in each subsequent year. Therefore, a negative adjustment is required.

Table VII-37: Existing 90.300(a)

First Year Burden Hour and Cost Reductions to Write Dust Plans Related to the
Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Dust Plans to Write	Time to Write Plan (hrs.)	Reduced First Year Hours	Supervisor Wage Rate (per hr.)	First Year Cost Reductions
Underground Coal Mines					
<20 emp.	0	3	0	\$49.79	\$0
≥20 emp. ≤500 no lgwl	2	3	6	\$49.79	\$299
≥20 emp. ≤500 lgwl	1	3	3	\$49.79	\$149
Sub-Total	3		9		\$448
>500 emp. no lgwl	0	3	0	\$49.79	\$0
>500 emp. lgwl	0	3	0	\$49.79	\$0
Sub-Total	0		0		\$0
First Year Hours and Costs			9		\$448

Table VII-38: Existing 90.300(a)

Adjusted First Year and Annualized Burden Hour and Cost Reductions to Write Dust Plans Related to Reduced Citations Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced First Year Hours ^a	Reduced Annual Hours ^b	Adjusted Reduced First Year Hours ^c	
Underground Coal Mines				
<20 emp.	0	3	-3	
≥20 emp. ≤500 no lgwl	6	12	-6	
≥20 emp. ≤500 lgwl	3	3	0	
Sub-Total	9	15	-6	
>500 emp. no lgwl	0	0	0	
>500 emp. lgwl	0	0	0	
Sub-Total	0	0	0	
First Year Hours	9	18	-9	
Mine Size	First Year Costs Reductions ^d	Annual Cost Reductions ^e	Adjusted First Year Cost Reductions ^f	Adjusted First Year Cost Reductions Annualized ^g
<20 emp.	\$0	\$149	-\$149	-\$10.46
≥20 emp. ≤500 no lgwl	\$299	\$597	-\$299	-\$20.91
≥20 emp. ≤500 lgwl	\$149	\$149	\$0	\$0
Sub-Total	\$448	\$747	-\$299	-\$21
>500 emp. no lgwl	\$0	\$0	\$0	\$0
>500 emp. lgwl	\$0	\$0	\$0	\$0
Sub-Total	\$0	\$0	\$0	\$0
First Year Costs	\$448	\$896	-\$448	-\$31

^a Reduced first year hours from Table VII-37.

^b Reduced annual hours from Table VII-39.

^c Reduced first year hours minus reduced annual hours.

^d First year cost reductions from Table VII-37.

^e Annual cost reductions from Table VII-39.

^f First year cost reductions minus annual cost reductions.

^g Adjusted first year cost reductions x an annualization factor of 0.07.

Existing § 90.300(a)

Annual Cost Reductions to Write a Respirable Dust Control
Program for Certain Types of Citations Related to the
Reduced Number of Citations Issued Based on MSHA Inspector
Sample Results

Annually, after the first year, MSHA estimates that some operators must write and submit to MSHA a respirable dust control program after a part 90 citation has been abated.

For every year after the first year, MSHA estimates:

- 1 reduced Part 90 citation in a mine employing fewer than 20 workers;
- 5 reduced part 90 citations in mines employing 20 to 500 workers (4 in a non-longwall mine and 1 in a longwall mine).

MSHA estimates that it would take a mine supervisor an average of 3 hours to write a plan.

Table VII-39 shows operators' annual hour and cost reductions associated with writing a dust plan concerning citations issued based on MSHA inspector sample results.

Table VII-39: Existing 90.300(a)

Annual Burden Hour and Cost Reductions to Write Dust Plans Related to the
Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Dust Plans to Write	Time to Write Plan (hrs.)	Reduced Annual Hours	Supervisor Hourly Wage Rate	Annual Cost Reductions
Underground Coal Mines					
<20 emp.	1	3	3	\$49.79	\$149
≥20 emp. ≤500 no lgwl	4	3	12	\$49.79	\$597
≥20 emp. ≤500 lgwl	1	3	3	\$49.79	\$149
Sub-Total	5		15		\$747
>500 emp. no lgwl	0	3	0	\$49.79	\$0
>500 emp. lgwl	0	3	0	\$49.79	\$0
Sub-Total	0		0		\$0
Annual Hours and Costs			18		\$896

Existing § 90.301(d)

First Year Cost Reductions to Provide to Miners a Copy of Respirable Dust Control Plan Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

After an underground coal mine operator has an approved respirable dust control plan, then under § 90.301(d) the operator must provide a copy of the approved respirable dust control plan to the part 90 miner.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and provide the plan to the part 90 miner. For the reduced citations the above costs would not occur.

During the first year of MSHA estimates:

- 3 reduced part 90 citations in underground mines employing 20 to 500 workers (2 in a non-longwall mine and 1 in a longwall mine).

Table VII-40 shows operators' first year hours and cost reductions associated with providing a copy of the dust plan to the affected miner concerning citations issued based on MSHA inspector sample results.

Table VII-41 shows operators' adjusted first year and annualized hour and cost reductions associated with providing a copy of the dust plan to the affected miner concerning citations issued based on MSHA inspector sample results.⁶⁴

⁶⁴ Note that the adjusted first year burden hour and cost reductions are negative numbers. This is because, even though the first year burden and cost reductions are positive, they are less than the annual burden and cost reductions in each subsequent year. Therefore, a negative adjustment is required.

Table VII-40: Existing 90.301(d)
First Year Burden Hour and Cost Reductions to Provide Dust Plans
to Miners' Related to the Reduced Number of Citations Issued
Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Dust Plans to Write	Time to Provide Dust Plan (hrs.)	Reduced First Year Hours	Supervisor Hourly Wage Rate	First Year Cost Reductions
Underground Coal Mines					
<20 emp.	0	0.1	0	\$18.56	\$0
≥20 emp. ≤500 no lgwl	2	0.1	0.2	\$18.56	\$4
≥20 emp. ≤500 lgwl	1	0.1	0.1	\$18.56	\$2
Sub-Total	3		0.3		\$6
>500 emp. no lgwl	0	0.1	0	\$18.56	\$0
>500 emp. lgwl	0	0.1	0	\$18.56	\$0
Sub-Total	0		0		\$0
First Year Hours and Costs			0.3		\$6

Table VII-41: Existing 90.301(d)

Adjusted First Year Burden Hour and Cost Reductions to Provide Dust
Plans to Miners Related to the Reduced Number of Citations Issued
Based on MSHA Inspector Sample Results

Mine Size	Reduced First Year Hours ^a	Reduced Annual Hours ^b	Adjusted First Year Hours ^c	
Underground Coal Mines				
<20 emp.	0	0.1	-0.1	
≥20 emp. ≤500 no lgwl	0.2	0.4	-0.2	
≥20 emp. ≤500 lgwl	0.1	0.1	0.0	
Sub-Total	0.3	0.5	-0.2	
>500 emp. no lgwl	0	0	0	
>500 emp. lgwl	0	0	0	
Sub-Total	0	0	0	
First Year Hours	0.3	0.6	-0.3	
Mine Size	First Year Costs Reductions ^d	Annual Cost Reductions ^e	Adjusted First Year Cost Reductions ^f	Adjusted First Year Cost Reductions Annualized ^g
<20 emp.	0	\$2	-\$2	-\$0.1
≥20 emp. ≤500 no lgwl	4	\$7	-\$4	-\$0.3
≥20 emp. ≤500 lgwl	2	\$2	\$0	\$0.00
Sub-Total	6	\$9	-\$4	-\$0.3
>500 emp. no lgwl	0	\$0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0	\$0
Sub-Total	0	\$0	\$0	\$0
First Year Costs	\$6	\$11	-\$6	-\$0.4

^a Reduced first year hours from Table VII-40.

^b Reduced annual hours from Table VII-42.

^c Reduced first year hours minus reduced annual hours.

^d First year cost reductions from Table VII-40.

^e Annual cost reductions from Table VII-42.

^f First year cost reductions minus annual cost reductions.

^g Adjusted first year cost reductions x an annualization factor of 0.07.

Existing § 90.301(d)

Annual Cost Reductions to Provide a Copy of the Dust Plan to Miners Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results

After an underground coal mine operators has an approved respirable dust control plan, then under § 90.301(d) the operator must provide a copy of the approved respirable dust control plan to the part 90 miner.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and provide the plan to the part 90 miner. For the reduced citations the above costs would not occur.

For underground mines, MSHA estimates:

- 1 reduced part 90 citation in a mine employing fewer than 20 workers;
- 5 reduced part 90 citations (4 in non-longwall mines and 1 in a longwall mine) employing 20 to 500 workers.

Table VII-42 shows underground coal operators burden hour and cost reductions for posting or copying the dust plan associated with the reduced number of citations issued based on MSHA inspector sample results.

Table VII-42: Existing 90.301(d)
Annual Burden Hour and Cost Reductions to Provide Dust Plans
to Miners Related to the Reduced Number of Citations Issued
Based on MSHA Inspector Sample Results

Mine Size	Reduced No. of Dust Plans	Time to Provide Dust Plan (hrs.)	Reduced Annual Hours	Clerical Hourly Wage Rate	Annual Cost Reductions
Underground Coal Mines					
<20 emp.	1	0.1	0.1	\$18.56	\$2
≥20 emp. ≤500 no lgwl	4	0.1	0.4	\$18.56	\$7
≥20 emp. ≤500 lgwl	1	0.1	0.1	\$18.56	\$2
Sub-Total	5		0.5		\$9
>500 emp. no lgwl	0	0	0	\$0	\$0
>500 emp. lgwl	0	0	0	\$0	\$0
Sub-Total	0		0		\$0
Annual Hours and Costs			1		\$11

Table VII-43 provides a summary of the paperwork provisions discussed above that are related to the adjusted first year and annual reduced burden cost and hour reductions associated with reduced citations issued based on MSHA inspector sample results.

Table VII-43:

Summary of Adjusted First Year and Annual Burden Hour and Cost Reductions for Mine Operators
Related to the Reduced Number of Citations Issued Based on MSHA Inspector Sample Results *

Burden Hour Reductions								
Description	<20 emp.		≥20 emp. ≤500		>500 emp.		Total	
	Adjusted First Year Hours	Annual Hours	Adjusted First Year Hours	Annual Hours	Adjusted First Year Hours	Annual Hours	Adjusted First Year Hours	Annual Hours
Abatement Sampling	0	910	0	2,640	0	100	0	3,650
Dust Data Cards	0	23	0	66	0	3	0	91
Send Samples to MSHA	0	76	0	220	0	8	0	304
Write Dust Plan	-3	3	-6	15	0	0	-9	18
Post or Give Dust Plan	-0.1	0.1	-0.2	0.5	0	0	-0.3	1
Total Underground	-3.1	1,012	-6.2	2,941	0	111	-9	4,064

Burden Cost Reductions												
Description	<20 emp.			≥20 emp. ≤500			>500 emp.			Total		
	Adjusted First Year Cost	Annual-ized Cost	Annual Cost	Adjusted First Year Cost	Annual-ized Cost	Annual Cost	Adjusted First Year Cost	Annual-ized Cost	Annual Cost	Adjusted First Year Cost	Annual-ized Cost	Annual Cost
	Reductions	Reductions	Reductions	Reductions	Reductions	Reductions	Reductions	Reductions	Reductions	Reductions	Reductions	Reductions
Abatement Sampling	\$0	\$0	\$21,954	\$0	\$0	\$63,691	\$0	\$0	\$2,413	\$0	\$0	\$88,057
Dust Data Cards	\$0	\$0	\$1,133	\$0	\$0	\$3,286	\$0	\$0	\$124	\$0	\$0	\$4,543
Send Samples to MSHA	\$0	\$0	\$1,440	\$0	\$0	\$4,178	\$0	\$0	\$158	\$0	\$0	\$5,777
Write Dust Plan	-\$149	-\$10	\$149	-\$299	-\$21	\$747	\$0	\$0	\$0	-\$448	-\$31	\$896
Post or Give Dust Plan	-\$2	\$0	\$2	-\$4	\$0	\$9	\$0	\$0	\$0	-\$6	\$0	\$11
Total Underground	-\$151	-\$11	\$24,678	-\$302	-\$21	\$71,911	\$0	\$0	\$2,695	-\$454	-\$32	\$99,285

Existing §§ 70.201(d) & 90.201(d)
Annual Abatement Sampling Burden Hour and Cost Reductions
Related to the Reduced Number of Citations Issued Based on
Operator Bi-Monthly Sample Results

The elimination of bi-monthly sampling would mean that abatement sampling related to citations issued based on operator bi-monthly sample results would be the responsibility of MSHA inspectors instead of mine operators. Operators would derive cost savings from no longer performing such abatement sampling.

For each citation, 5 abatement samples would be taken. It is estimated to take about 1 hr. to take a sample. This hour is composed of 0.8333 hrs. for a certified dust technician to prepare, disassemble, and clean the sampler unit after sampling and 0.1666 hrs. for a mine supervisor to make the required operational checks during the sampling period. The sampling costs are estimated to be \$24.13 per sample $[(0.8333 \times \$19) + (0.1666 \times \$49.79)]$. As a result of the PV rule, the above costs would not be incurred due to the elimination of operator abatement sampling.

Reductions in paperwork burden hours are realized only for those mines that perform their own sampling with either their own or rented equipment. Thus, the following reductions in citations are estimated for each mine size category.

For underground coal mines:

- 85 of the 89 reduced citations in mines employing fewer than 20 workers (96% of these mines perform their own sampling);
- 390 of the 406 reduced citations in non-longwall mines employing 20 to 500 workers (96% of these mines perform their own sampling);
- 41 reduced citations in longwall mines employing 20 to 500 workers (100% of these mines perform their own sampling);
- 9 reduced citations in non-longwall mines employing more than 500 workers (100% of such mines perform their own sampling);
- and 10 reduced citations in longwall mines employing more than 500 workers (100% of these mines perform their own sampling).

Table VII-44 shows underground coal operators' annual abatement sampling burden hour and cost reductions related to citations issued based on operator bi-monthly sample results.

Table VII-44: Existing 70.201(d) & 90.201(d)
Annual Abatement Sampling Burden Hour and Cost Reductions Related to the
Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced No. of Citations	No. of Samples Per Citation	Sample Time (hr.)	Reduced Annual Hours	Cost Per Sample ^a	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	85	5	1	425	\$24.13	\$10,253
≥20 emp. ≤500 no lgwl	390	5	1	1,950	\$24.13	\$47,044
≥20 emp. ≤500 lgwl	41	5	1	205	\$24.13	\$4,946
Sub-Total	431			2,155		\$51,990
>500 emp. no lgwl	9	5	1	45	\$24.13	\$1,086
>500 emp. lgwl	10	5	1	50	\$24.13	\$1,206
Sub-Total	19			95		\$2,292
Annual Hours and Costs				2,675		\$64,535

^a \$24.13 = (0.8333 x \$19 wage) + (0.1666 hr. x \$49.79 wage)

Existing §§ 70.201(d) & 90.201(d)
Annual Burden Hour and Cost Reductions for Abatement
Sampling Dust Cards Related to the Reduced Number of
Citations Issued Based on Operator Bi-Monthly Sample Results

As a result of mine operators no longer performing abatement sampling in response to citations issued based on operator bi-monthly sample results, the associated dust data cards would also no longer need to be completed.

Five abatement samples are taken for each citation, and a dust data card must be completed for each sample taken. MSHA estimates that after each sample it would take 0.025 hours (about 1.5 minutes) for a mine safety inspector, or equivalent person, to complete and sign the dust data card. The mine safety inspector hourly wage rate is similar to a mine supervisor's wage rate of \$49.79. As a result of the PV rule, the above costs would not be incurred due to reduced citations associated with bi-monthly operator citations.

Reductions in paperwork burden hours are realized only for those mines that perform their own sampling with either their own or rented equipment. Thus, the following reductions in citations are estimated for each mine size category.

For underground coal mines:

- 85 of the 89 reduced citations in mines employing fewer than 20 workers (96% of these mines perform their own sampling);
- 390 of the 406 reduced citations in non-longwall mines employing 20 to 500 workers (96% of these mines perform their own sampling);
- 41 reduced citations in longwall mines employing 20 to 500 workers (100% of these mines perform their own sampling);
- 9 reduced citations in non-longwall mines employing more than 500 workers (100% of such mines perform their own sampling; and
- 10 reduced citations in longwall mines employing more than 500 workers (100% of these mines perform their own sampling).

Table VII-45 shows underground coal operators' burden hour and cost reductions for abatement sampling dust cards associated with the reduced number of citations issued based on operator bi-monthly sample results.

Table VII-45: Existing 70.209(c) & 90.209(c)
Annual Burden Hour and Cost Reductions for Completing Dust
Cards for Abatement Sampling Related to the Number of Citations
Issued Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced No. of Citations	No. of Samples Per Citation	Time For Card (hrs.)	Reduced Annual Hours	Technician Hourly Wage Rate	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	85	5	0.025	11	49.79	\$529
≥20 emp. ≤500 no lgwl	390	5	0.025	49	49.79	\$2,427
≥20 emp. ≤500 lgwl	41	5	0.025	5	49.79	\$255
Sub-Total	431			54		\$2,682
>500 emp. no lgwl	9	5	0.025	1.13	49.79	\$56
>500 emp. lgwl	10	5	0.025	1.25	49.79	\$62
Sub-Total	19			2.38		\$118
Total Hours and Costs						
				67		\$3,330

Existing §§ 70.209(a) & 90.209(a)
Annual Burden Hour and Cost Reductions for Sending Abatement
Samples and Dust Cards to MSHA Related to the Reduced Number
of Citations Issued Based on Operator Bi-Monthly Sample
Results

As a result of mine operators no longer performing abatement sampling in response to citations issued based on operator bi-monthly sample results, there would be cost savings to mine operators for not having to send to MSHA abatement samples and related dust data cards.

Five abatement samples are taken for each citation. Each abatement sample, along with its dust data card, is sent by the dust technician to an MSHA laboratory for analysis. MSHA estimates that it takes a certified dust technician 0.0833 hours to prepare and send in 1 sample along with the dust data card to MSHA. As a result of the PV rule, the above costs would not be incurred due to the elimination of operator abatement sampling. There are no burden hour decreases related to postage costs incurred to mail the samples; therefore they are not included in the calculation below as cost reductions related to burden hours.

Reductions in paperwork burden hours are realized only for those mines that perform their own sampling with either their own or rented equipment. Thus, the following reductions in citations are estimated for each mine size category.

For underground coal mines:

- 85 of the 89 reduced citations in mines employing fewer than 20 workers (96% of these mines perform their own sampling);
- 390 of the 406 reduced citations in non-longwall mines employing 20 to 500 workers (96% of these mines perform their own sampling);
- 41 reduced citations in longwall mines employing 20 to 500 workers (100% of these mines perform their own sampling);
- 9 reduced citation in non-longwall mines employing more than 500 workers (100% of such mines perform their own sampling);
- and 10 reduced citations in longwall mines employing more than 500 workers (100% of these mines perform their own sampling).

Table VII-46 shows underground coal operators' burden hour and cost reductions for sending abatement samples and dust cards to MSHA related to citations issued based on operator bi-monthly sample results.

Table VII-46: Existing 70.209(a) & 70.209(a)
Annual Burden Hour and Cost Reductions to Send to MSHA
Abatement Samples and Dust Cards Related to the Reduced
Number of Citations Issued Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced No. of Citations	No. of Samples Per Citation	Time to Send (hrs.)	Reduced Annual Hours	Technician Hourly Wage Rate	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	85	5	0.0833	35	\$19	\$673
≥20 emp. ≤500 no lgwl	390	5	0.0833	162	\$19	\$3,086
≥20 emp. ≤500 lgwl	41	5	0.0833	17	\$19	\$324
Sub-Total	431			180		\$3,411
>500 emp. no lgwl	9	5	0.0833	4	\$19	\$71
>500 emp. lgwl	10	5	0.0833	4	\$19	\$79
Sub-Total	19			8		\$150
Total Hours and Costs				223		\$4,234

Existing § 90.300(a)

First Year Cost Reductions to Write a Respirable Dust Control Program for Certain Types of Citations Related to the Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results

An operator must write and submit to MSHA a respirable dust control program after a part 90 citation has been abated. Under § 90.300(a), the mine operator must submit a written plan for the miner involved in the Part 90 citation. MSHA estimates that it would take a mine supervisor an average of 3 hours to write a plan. For the eliminated citations the above costs would not occur.

During the first year of MSHA estimates:

- 1 reduced part 90 citations in an underground non-longwall mine that employs 20 to 500 workers.

Table VII-47 shows operators' first year hours and cost reductions associated with writing a dust plan concerning citations issued based on operator bi-monthly sample results.

Table VII-48 shows operators' adjusted first year and annualized hour and cost reductions associated with writing a dust plan concerning citations issued based on operator bi-monthly sample results.⁶⁵

⁶⁵ Note that the adjusted first year burden hour and cost reductions are negative numbers. This is because, even though the first year burden and cost reductions are positive, they are less than the annual burden and cost reductions in each subsequent year. Therefore, a negative adjustment is required.

Table VII-47: Existing 90.300(a)

First Year Burden Hour and Cost Reductions to Write Dust Plans

Related to the Reduced Number of Citations Issued

Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced No. of Dust Plans to Write	Time to Write Plan (hrs.)	Reduced First Year Hours	Supervisor Hourly Wage Rate	First Year Cost Reductions
Underground Coal Mines					
<20 emp.	0	3	0	\$49.79	\$0
≥20 emp. ≤500 no lgwl	1	3	3	\$49.79	\$149
≥20 emp. ≤500 lgwl	0	3	0	\$49.79	\$0
Sub-Total	1		3		\$149
>500 emp. no lgwl	0	3	0	\$49.79	\$0
>500 emp. lgwl	0	3	0	\$49.79	\$0
Sub-Total	0		0		\$0
First Year Hours and Costs			3		\$149

Table VII-48: Existing 90.300(a)
Adjusted First Year and Annualized Burden Hour and Cost Reductions
to Write Dust Plans Related to the Reduced Number of Citations Issued
Based on Operatoar Bi-Monthly Sample Results

Mine Size	Reduced First Year Hours ^a	Reduced Annual Hours ^b	Adjusted Reduced First Year Hours ^c
Underground Coal Mines			
<20 emp.	0	3	-3
≥20 emp. ≤500 no lgwl	3	3	0
≥20 emp. ≤500 lgwl	0	3	-3
Sub-Total	3	6	-3
>500 emp. no lgwl	0	0	0
>500 emp. lgwl	0	0	0
Sub-Total	0	0	0
First Year Hours	3	9	-6

Mine Size	First Year Costs Reductions ^d	Annual Cost Reductions ^e	Adjusted First Year Cost Reductions ^f	Adjusted First Year Cost Reductions Annualized ^g
<20 emp.	\$0	\$149	-\$149	-\$10
≥20 emp. ≤500 no lgwl	\$149	\$149	\$0	\$0
≥20 emp. ≤500 lgwl	\$0	\$149	-\$149	-\$10
Sub-Total	\$149	\$299	-\$149	-\$10
>500 emp. no lgwl	\$0	\$0	\$0	\$0
>500 emp. lgwl	\$0	\$0	\$0	\$0
Sub-Total	\$0	\$0	\$0	\$0
First Year Costs	\$149	\$448	-\$299	-\$21

^a Reduced first year hours from Table VII-47.

^b Reduced annual hours from Table VII-49.

^c Reduced first year hours minus reduced annual hours.

^d First year cost reductions from Table VII-47.

^e Annual cost reductions from Table VII-49.

^f First year cost reductions minus annual cost reductions.

^g Adjusted first year cost reductions x an annualization factor of 0.07.

Existing § 90.300(a)

Annual Cost Reductions to Write a Respirable Dust Control Program for Certain Types of Citations Related to the Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results

Annually, after the first year, MSHA estimates the following operators must write and submit to MSHA a respirable dust control program after a part 90 citation has been abated.

For every year after the first year, MSHA estimates:

- 1 reduced Part 90 citation in a mine employing fewer than 20 workers;
- 2 reduced part 90 citations in mines employing 20 to 500 workers (1 in a non-longwall mine and 1 in a longwall mine).

MSHA estimates that it would take a mine supervisor an average of 3 hours to write a plan.

Table VII-49 shows operators' annual hour and cost reductions associated with writing a dust plan concerning citations issued based on operator bi-monthly sample results.

Table VII-49: Existing 90.300(a)
Total Annual Burden Hour and Cost Reductions to Write Dust Plans
Related to the Reduced Number of Bi-Monthly Operator Citations

Mine Size	Reduced No. of Dust Plans to Write	Time to Write Plan (hrs.)	Reduced Annual Hours	Supervisor Hourly Wage Rate	Annual Cost Reductions
Underground Coal Mines					
<20 emp.	1	3	3	\$49.79	\$149
≥20 emp. ≤500 no lgwl	1	3	3	\$49.79	\$149
≥20 emp. ≤500 lgwl	1	3	3	\$49.79	\$149
Sub-Total	2		6		\$299
>500 emp. no lgwl	0	0	0	\$49.79	\$0
>500 emp. lgwl	0	0	0	\$49.79	\$0
Sub-Total	0		0		\$0
Annual Hours and Costs					
			9		\$448

Existing § 90.300(a)

First Year Cost Reductions to Provide to Miners a Copy of
the Respirable Dust Control Program for Certain Types of
Citations Related to the Reduced Number of Citations Issued
Based on Operator Bi-Monthly Sample Results

After an underground coal mine operator has an approved respirable dust control plan, then under § 90.301(d) the operator must provide a copy of the approved respirable dust control plan to the part 90 miner.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and provide the plan to the part 90 miner. For the reduced citations the above costs would not occur.

During the first year of MSHA estimates:

- 1 reduced part 90 citation in an underground non-longwall mine employing 20 to 500 workers.

Table VII-50 shows operators' first year hours and cost reductions associated with providing a copy of the dust plan to the affected miner concerning citations issued based on operator bi-monthly sample results.

Table VII-51 shows operators' adjusted first year and annualized hour and cost reductions associated with providing a copy of the dust plan to the affected miner concerning citations issued based on operator bi-monthly sample results.⁶⁶

⁶⁶ Note that the adjusted first year burden hour and cost reductions are negative numbers. This is because, even though the first year burden and cost reductions are positive, they are less than the annual burden and cost reductions in each subsequent year. Therefore, a negative adjustment is required.

Table VII-50: Existing 90.301(d)
First Year Burden Hour and Cost Reductions to Provide Dust Plans
to Miners Related to the Reduced Number of Citations Issued
Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced No. of Dust Plans to Write	Time to Provide Dust Plan (hrs.)	Reduced First Year Hours	Supervisor Hourly Wage Rate	First Year Cost Reductions
Underground Coal Mines					
<20 emp.	0	0.1	0	\$18.56	\$0
≥20 emp. ≤500 no lgwl	1	0.1	0.1	\$18.56	\$2
≥20 emp. ≤500 lgwl	0	0.1	0.0	\$18.56	\$0
Sub-Total	1		0.1		\$2
>500 emp. no lgwl	0	0.1	0	\$18.56	\$0
>500 emp. lgwl	0	0.1	0	\$18.56	\$0
Sub-Total	0		0		\$0
First Year Hours and Costs			0.1		\$2

Table VII-51: Existing 90.301(d)

Adjusted First Year Burden Hour and Cost Reductions to Provide Dust Plans to Miners Related to the Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results

Mine Size	Reduced First Year Hours ^a	Reduced Annual Hours ^b	Adjusted Reduced First Year Hours ^c
Underground Coal Mines			
<20 emp.	0	0.1	-0.1
≥20 emp. ≤500 no lgwl	0.1	0.2	-0.1
≥20 emp. ≤500 lgwl	0.0	0.0	0.0
Sub-Total	0.1	0.2	-0.1
>500 emp. no lgwl	0	0	0
>500 emp. lgwl	0	0	0
Sub-Total	0	0	0
First Year Hours	0.1	0.3	-0.2

Mine Size	First Year Costs Reductions ^d	Annual Cost Reductions ^e	Adjusted First Year Cost Reductions ^f	Adjusted First Year Cost Reductions Annualized ^g
<20 emp.	0	\$2	-\$2	-\$0.1
≥20 emp. ≤500 no lgwl	2	\$4	-\$2	-\$0.1
≥20 emp. ≤500 lgwl	0	\$0	\$0	\$0.00
Sub-Total	2	\$4	-\$2	-\$0.1
>500 emp. no lgwl	0	\$0	\$0	\$0
>500 emp. lgwl	0	\$0	\$0	\$0
Sub-Total	0	\$0	\$0	\$0
First Year Costs	\$2	\$6	-\$4	-\$0.3

^a Reduced first year hours from Table VII-50.

^b Reduced annual hours from Table VII-52.

^c Reduced first year hours minus reduced annual hours.

^d First year cost reductions from Table VII-50.

^e Annual cost reductions from Table VII-52.

^f First year cost reductions minus annual cost reductions.

^g Adjusted first year cost reductions x an annualization factor of 0.07.

Existing § 90.301(d)

Annual Cost Reductions to Provide a Copy of the Dust Plan to Miners Related to the Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results

After an underground coal mine operators has an approved respirable dust control plan, then under § 90.301(d) the operator must provide a copy of the approved respirable dust control plan to the part 90 miner.

MSHA estimates that it would take a clerical worker 0.1 hours (6 minutes) to copy and provide the plan to the part 90 miner. For the eliminated citations the above costs would not occur.

For underground mines, MSHA estimates:

- 1 reduced part 90 citation in a mine employing fewer than 20 workers;
- 2 reduced part 90 citations in mines employing 20 to 500 workers (1 in a non-longwall mine and 1 in a longwall mine).

Table VII-52 shows underground coal operators burden hour and cost reductions for posting or copying the dust plan associated with the reduced number of citations issued based on MSHA inspector sample results.

Table VII-52: Existing 90.301(d)
Annual Burden Hour and Cost Reductions to Provide Dust Plan to
Miners That are Related to the Reduced Number of Bi-Monthly Citations

Mine Size	Reduced No. of Dust Plans	Time to Copy or Provide Dust Plan (hrs.)	Reduced Annual Hours	Clerical Hourly Wage Rate	Annual Cost Reductions
Underground Coal Mines					
<20 emp.	1	0.1	0.1	\$18.56	\$2
≥20 emp. ≤500 no lgwl	1	0.1	0.1	\$18.56	\$2
≥20 emp. ≤500 lgwl	1	0.1	0.1	\$18.56	\$2
Sub-Total	2		0.2		\$4
>500 emp. no lgwl	0	0.1	0	\$18.56	\$0
>500 emp. lgwl	0	0.1	0	\$18.56	\$0
Sub-Total	0		0		\$0
Annual Hours and Costs			0.3		\$6

Table VII-53 provides a summary of the paperwork provisions discussed above involving adjusted first year and annual reduced burden hours and costs related to the reduced number of citations issued based on operator bi-monthly sample results.

Table VII-53:

Summary of Adjusted First Year and Annual Burden Hour and Cost Reductions for Mine Operators
Related to the Reduced Number of Citations Issued Based on Operator Bi-Monthly Sample Results *

Burden Hour Reductions												
Description	<20 emp.		>20 emp. <500		>500 emp.		Total		Adjusted First Year Hours	Annual Hours	Adjusted First Year Hours	Annual Hours
	Adjusted First Year Hours	Annual Hours	Adjusted First Year Hours	Annual Hours	Adjusted First Year Hours	Annual Hours	Adjusted First Year Hours	Annual Hours				
Abatement Sampling	0	425	0	2,155	0	95	0	2,675				
Dust Data Cards	0	11	0	54	0	2	0	67				
Send Samples to MSHA	0	35	0	180	0	8	0	223				
Write Dust Plan	-3	3	-3	6	0	0	-6	9				
Post or Give Dust Plan	-0.1	0.1	-0.1	0.2	0	0	-0.2	0.3				
Total Underground	-3	474	-3	2,394	0	105	-6	2,974				
Burden Cost Reductions												
Description	<20 emp.			>20 emp. <500			>500 emp.			Total		
	Adjusted First Year Cost Reductions	Annual-ized Cost Reductions	Annual Cost Reductions	Adjusted First Year Cost Reductions	Annual-ized Cost Reductions	Annual Cost Reductions	Adjusted First Year Cost Reductions	Annual-ized Cost Reductions	Annual Cost Reductions	Adjusted First Year Cost Reductions	Annual-ized Cost Reductions	Annual Cost Reductions
Abatement Sampling	\$0	\$0	\$10,253	\$0	\$0	\$51,990	\$0	\$0	\$2,292	\$0	\$0	\$64,535
Dust Data Cards	\$0	\$0	\$529	\$0	\$0	\$2,682	\$0	\$0	\$118	\$0	\$0	\$3,330
Send Samples to MSHA	\$0	\$0	\$673	\$0	\$0	\$3,411	\$0	\$0	\$150	\$0	\$0	\$4,234
Write Dust Plan	-\$149	-\$10	\$149	-\$149	-\$10	\$299	\$0	\$0	\$0	-\$299	-\$21	\$448
Post or Give Dust Plan	-\$2	\$0	\$2	-\$2	\$0	\$4	\$0	\$0	\$0	-\$4	-\$0.3	\$6
Total Underground	-\$151	-\$11	\$11,606	-\$151	-\$11	\$58,386	\$0	\$0	\$2,561	-\$302	-\$21	\$72,552

* Source: Table VII-44 through Table VII-52.

Annual Sampling Burden Hour and Cost Reductions Related to the Elimination of Bi-Monthly Operator Sampling

With respect to mine operators that employ fewer than 20 workers, MSHA estimates that, on average, each bi-monthly period mine operators take 5 samples per MMU and 1 DA sample per MMU. In addition, for each DA sample over the applicable dust standard, the operator takes 5 more DA samples. MSHA assumes that, for all mine size categories, 10% of all DA samples taken within a year will show an overexposure. Therefore, on average, on an annual basis (sampling 6 times per year), mines with fewer than 20 workers take 39 samples per MMU $[(5 \text{ samples}) + (1 \text{ DA sample}) + (1 \text{ DA sample} \times 0.10 \times 5) \times 6 \text{ times per yr.}]$.

With respect to mine operators that employ 20 to 500 workers, MSHA estimates that, on average, each bi-monthly period mine operators take: 5 samples per MMU and between 1 and 2 (an average of 1.5) DA samples per MMU. Therefore, on average, on an annual basis (sampling 6 times per year), mines that employ 20 to 500 workers take 43.5 samples per MMU $[(5 \text{ samples}) + (1.5 \text{ DA samples}) + (1.5 \text{ DA samples} \times 0.10 \times 5) \times 6 \text{ times per yr.}]$.

With respect to mine operators that employ more than 500 workers, MSHA estimates that, on average, each bi-monthly period mine operators take 5 samples per MMU and 5 DA sample per MMU. Therefore, on average, on an annual basis (sampling 6 times per year), mines that employ more than 500 workers take 75 samples per MMU $[(5 \text{ samples}) + (5 \text{ DA samples}) + (5 \text{ DA samples} \times 0.10 \times 5) \times 6 \text{ times per yr.}]$.

The number of MMUs affected are: 211 MMUs for mines employing fewer than 20 workers; 691 MMUs for non-longwall mines employing between 20 to 500 workers; 45 MMUs for longwall mines employing between 20 to 500 workers; 30 MMUs for non-longwall mines employing more than 500 workers; and 7 MMUs for longwall mines employing more than 500 Workers.

MSHA estimates that about 1 hr. is needed to take a sample. This hour is composed of 0.8333 hrs. for a certified dust technician to prepare, disassemble, and clean the sampler unit after sampling and 0.1666 hrs. for a mine supervisor to make the required operational checks during the sampling period.

Table VII-54 shows annual burden hour and cost reductions to mine operators for no longer having to perform bi-monthly sampling. The estimated sampling costs associated with burden hours are footnoted in Table VII-54 and are those stated in Table IV-8 in Chapter IV, except that they do not have equipment costs embedded in them. Equipment costs are not included in the rates in Table VII-54 because such costs are not related to burden hours.

Table VII-54:
Total Annual Sampling Burden Hour and Cost Reductions
Related to the Elimination of Bi-Monthly Operator Sampling

Mine Size	No. of MMUs	No. of Samples	Sample Time (hr.)	Reduced Annual Hours	Cost Per Sample ^a	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	211	39	1	8,228	\$23.16	\$190,565
≥20 emp. ≤500 no lgwl	691	43.5	1	30,055	\$23.16	\$696,085
≥20 emp. ≤500 lgwl	45	43.5	1	1,957	\$24.13	\$47,225
Sub-Total	736			32,013		\$743,311
>500 emp. no lgwl	30	75	1	2,250	\$24.13	\$54,282
>500 emp. lgwl	7	75	1	525	\$24.13	\$12,666
Sub-Total	37			2,775		\$66,948
Annual Hours and Costs				43,016		\$1,000,823

^a MMUs in mines that employ <20 workers: \$23.16 rate based on 63% of MMUs related to operators that sample with own equipment and 33% of MMUs related to operators that sample with rented equipment.

$$\begin{aligned} \$23.16 = & (0.63 \times (0.8333 \text{ hr.} \times \$19 \text{ wage}) + (0.1666 \text{ hr.} \times \$49.79 \text{ wage})) + \\ & (0.33 \times (0.8333 \text{ hr.} \times \$19 \text{ wage}) + (0.1666 \text{ hr.} \times \$49.79 \text{ wage})) \end{aligned}$$

MMUs in non-longwall mines that employ between 20 to 500 workers: \$23.16 rate based on 66% of MMUs related to operators that sample with own equipment and 30% of MMUs related to operators that sample with rented equipment.

$$\begin{aligned} \$23.16 = & (0.66 \times (0.8333 \text{ hr.} \times \$19 \text{ wage}) + (0.1666 \text{ hr.} \times \$49.79 \text{ wage})) + \\ & (0.30 \times (0.8333 \text{ hr.} \times \$19 \text{ wage}) + (0.1666 \text{ hr.} \times \$49.79 \text{ wage})) \end{aligned}$$

MMUs in longwall mines that employ between 20 to 500 workers and all MMUs in mines that employ more than 500 workers: \$24.13 rate based on 100% of MMUs related to operators that sample with own equipment.

$$\$24.13 = (1 \times (0.8333 \text{ hr.} \times \$19 \text{ wage}) + (0.1666 \text{ hr.} \times \$49.79)).$$

Annual Sampling Dust Data Card Burden Hour and Cost
Reductions Due to the Elimination of Bi-Monthly Operator
Sampling

As a result of mine operators no longer having to perform bi-monthly operator sampling, operators would no longer need to complete the associated dust data cards. Therefore, mine operators would realize cost savings from not spending time to complete dust data cards. Since a dust data card must be completed for each sample, the number of dust data cards no longer needed to be completed equals the number of samples no longer taken, as derived above.

Ninety-six percent of operators that employ fewer than 20 workers and non-longwall operators that employ 20 to 500 workers perform their own sampling. Therefore, in these mines the operator would complete the dust data cards. The remaining 4 percent of operators contract out sampling, and the contractor charge includes the cost to fill out dust data cards.⁶⁷

Therefore, this provision would affect 203 MMUs (211×0.96) in mines employing fewer than 20 workers and 663 (691×0.96) non-longwall MMUs in mines employing 20 to 500 workers. For MMUs in other mine categories, all sampling is performed by the mine operator, and the mine operator would always be the one to complete the dust card. Thus, this provision would affect: 45 longwall MMUs in mines employing 20 to 500 workers; 30 non-longwall MMUs in mines employing more than 500 workers; and 7 longwall MMUs in mines employing more than 500 workers.

MSHA estimates that to complete a dust card would take 0.025 hours (about 1.5 minutes) for a mine safety inspector or equivalent person. The mine safety inspector hourly wage rate is similar to a mine supervisor's hourly wage rate of \$49.79.

Table IV-55 shows annual burden hour and cost reductions to operators for not having to complete dust data cards as a result of the elimination of bi-monthly operator sampling.

⁶⁷ The percentage of operators performing their own sampling compared to those that contract out their sampling can be applied to the number of MMUs because the percentages for mines and MMUs within a size type category are approximately the same.

Table VII-55: Table VII-5 Table VII-5 Table VII-55: Table VII-55 Table VII-55:
Total Annual Burden Hour and Cost Reductions for Completing Dust Cards for
Sampling Related to the Elimination of Bi-Monthly Operator Sampling

Mine Size	No. of MMUs	No. of Dust Cards ^a	Time For Card (hrs.)	Reduced Annual Hours	Technician Wage Rate (per hr.)	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	203	39	0.025	197	\$49.79	\$9,833
≥20 emp. ≤500 no lgwl	663	43.5	0.025	721	\$49.79	\$35,919
≥20 emp. ≤500 lgwl	45	43.5	0.025	49	\$49.79	\$2,437
Sub-Total	708			770		\$38,355
>500 emp. no lgwl	30	75	0.025	56	\$49.79	\$2,801
>500 emp. lgwl	7	75	0.025	13	\$49.79	\$653
Sub-Total	37			69		\$3,454
Annual Hours and Costs				1,037		\$51,643

^a No. of Dust Cards equal to the No. of Samples from Table VII-54.

Annual Burden Hour and Cost Reductions Related to Sending to MSHA Bi-Monthly Operator Samples and Dust Data Card Which Is Due to the Elimination of Bi-Monthly Operator Sampling

As a result of mine operators no longer having to perform bi-monthly operator sampling, operators would no longer need to send the samples and related dust cards to MSHA for analysis. Therefore, mine operators would realize cost savings from not spending time to send the materials. The number of samples and dust data cards for which operators would realize a savings from not sending such materials to MSHA is the same as the number of samples and dust data cards that no longer need to be completed.

MSHA estimates that it takes a certified dust technician about 0.0833 hours (or 5 minutes) to prepare and send in one sample along with any relevant data to MSHA.

For 96 percent of MMUs in mines employing: (1) fewer than 20 workers, and (2) 20 to 500 workers in non-longwall MMUs, sampling is performed by the operator. Therefore, for MMUs in these mines the operator would complete the dust data cards. The remaining 4 percent of MMUs are in mines in which the operators contract out sampling, and the contractor charge includes the cost to send in the verification samples and dust data cards. Thus, this provision would affect 203 mines $[211 \times 0.96]$ MMUs in mines employing fewer than 20 workers, and 663 $[691 \times 0.96]$ non-longwall MMUs in mines employing 20 to 500 workers. For MMUs in other mine categories sampling is performed by the mine operator. Therefore, this provision would affect 45 longwall MMUs in mines employing 20 to 500 workers, 30 non-longwall MMUs in mines employing more than 500 workers, and 7 longwall MMUs in mines employing more than 500 workers.

Table IV-56 shows operators' annual burden hour and cost reductions for not having to send bi-monthly samples and dust data cards to MSHA for analysis.

Table VII-56:

Total Annual Burden Hour and Cost Reductions to Send to MSHA Bi-Monthly Samples and Dust Cards Related to the Elimination of Bi-Monthly Operator Sampling

Mine Size	No. of MMUs	No. of Samples ^a	Time to Send (hrs.)	Reduced Annual Hours	Technician Wage Rate (per hr.)	Annual Cost Reductions
Underground Coal Mines						
<20 emp.	203	39	0.0833	658	\$19	\$12,503
≥20 emp. ≤500 no lgwl	663	43.5	0.0833	2,404	\$19	\$45,671
≥20 emp. ≤500 lgwl	45	43.5	0.0833	163	\$19	\$3,098
Sub-Total	708			2,567		\$48,769
>500 emp. no lgwl	30	75	0.0833	187	\$19	\$3,561
>500 emp. lgwl	7	75	0.0833	44	\$19	\$831
Sub-Total	37			231		\$4,392
Annual Hours and Costs				3,456		\$65,664

^a No. of Samples from Table VII-54.

Summary of Annual Burden Hour and Cost Reductions From the
Elimination of Bi-Monthly Operator Sampling by Mine
Operators

Table VII-57 provides a summary of the paperwork provisions discussed above involving annual reduced burden hours and costs that are related to mine operators no longer performing bi-monthly sampling to show compliance with MSHA's respirable dust and silica standards.

Table VII-57:

Summary of Annual Burden Hour and Cost Reductions for Mine Operators
Related to the Elimination of Bi-Monthly Operator Sampling *

Description	<20 emp.		>20 emp. <500		>500 emp.		Total	
	Hrs.	Costs	Hrs.	Costs	Hrs.	Costs	Hrs.	Costs
Underground Coal Mines								
Bi-Monthly Sampling	8,228	\$190,565	32,013	\$743,311	2,775	\$66,948	43,016	\$1,000,823
Dust Data Cards	197	\$9,833	770	\$38,355	69	\$3,454	1,037	\$51,643
Send Samples to MSHA	658	\$12,503	2,567	\$48,769	231	\$4,392	3,456	\$65,664
Total Underground	9,084	\$212,901	35,350	\$830,435	3,075	\$74,794	47,509	\$1,118,129

* Source: Table VII-54 through Table VII-56.

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